

United States
Department of
Agriculture

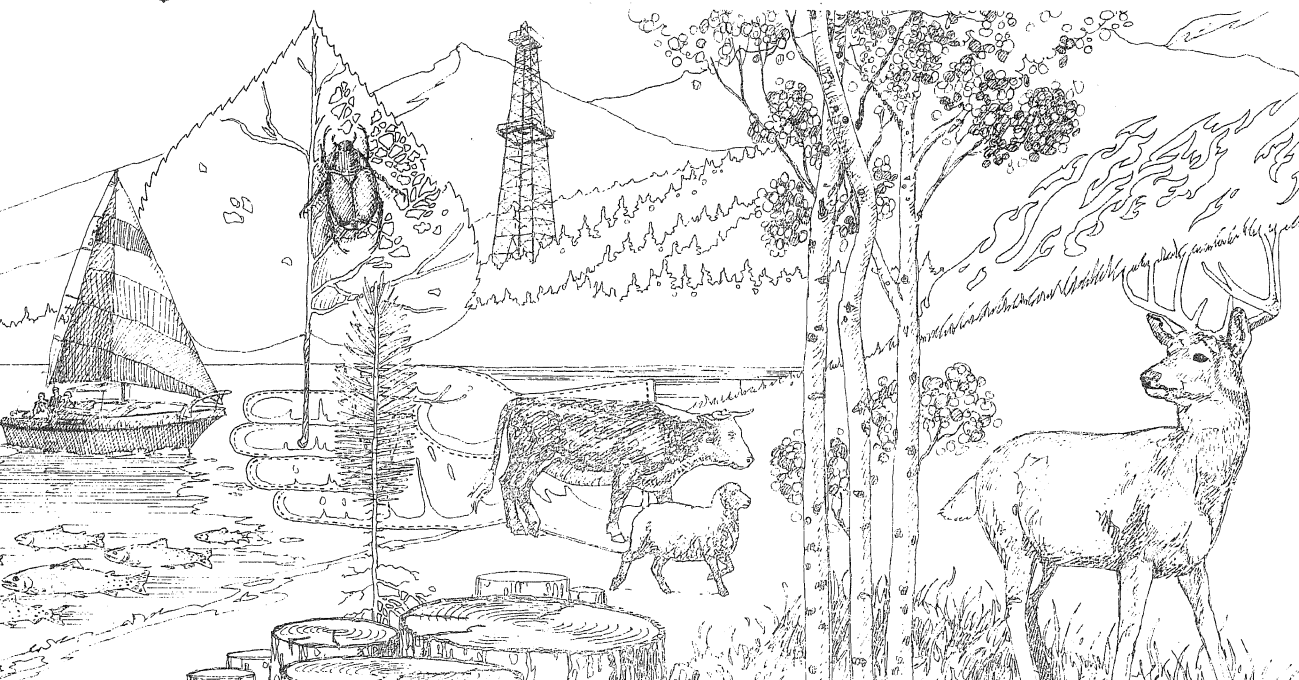
Forest
Service

General
Technical
Report
WO-30



Improving Productivity on Forests and Rangelands

1980 Research Accomplishments



IMPROVING PRODUCTIVITY ON FORESTS AND RANGELANDS

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General Technical Report WO-30

June 1981

FOREWORD

One of the major responsibilities of the Forest Service is forestry research — providing the information needed to manage and protect forest and related lands, gain maximum benefit from their use, and leave the environment unspoiled.

To accomplish these goals and to help solve the forestry problems confronting the Nation, we conduct research at eight regional forest experiment stations throughout the country and at the Forest Products Laboratory in Madison, Wisc. A map on page 135 shows the location of these research facilities. We also conduct international studies in forestry, as well as cooperative research with universities and other organizations.

The Forest Service research program addresses a variety of problems associated with increasingly complex land management challenges. The scope of the research program includes studies in seven broad areas:

1. Timber Management.
2. Fire and Atmospheric Sciences.
3. Forest Insects and Diseases.
4. Renewable Resources Evaluation and Economics.
5. Forest Products Utilization and Engineering.
6. Environmental Research including Range, Wildlife, and Fish Habitat; Watershed Management; Surface Mine Land Rehabilitation; and Recreation.
7. International Forestry Programs.

This report highlights the kinds of research in progress. Some of the articles report developments in ongoing projects; others describe completed research and how the findings are being applied.







Starting on page 49 is a list of all publications issued by the Forest Service staff during fiscal year 1980. This list, categorized by subject, suggests the diversity of our research programs. The categories are not mutually exclusive so even though you may be primarily interested in one subject, you will find related information in other categories.

For further information on accomplishments in which you are particularly interested, please contact the research headquarters mentioned in the highlights. Their addresses are on the inside back cover.



R. MAX PETERSON
Chief

CONTENTS

	Page
Environment	
 Highlights.....	1
Publications.....	49
Fire and Atmospheric Sciences	
 Highlights.....	12
Publications.....	75
Insects and Disease	
 Highlights.....	18
Publications.....	81
Products and Engineering	
 Highlights.....	24
Publications.....	97
Resource Economics	
 Highlights.....	32
Publications.....	106
Timber Management	
 Highlights.....	41
Publications.....	115
Subject Matter Guide for Research Publications.....	48

Acknowledgment

Delpha Noble, Public Information Officer at the Intermountain Forest and Range Experiment Station, was primarily responsible for collecting and preparing the material presented in this report.



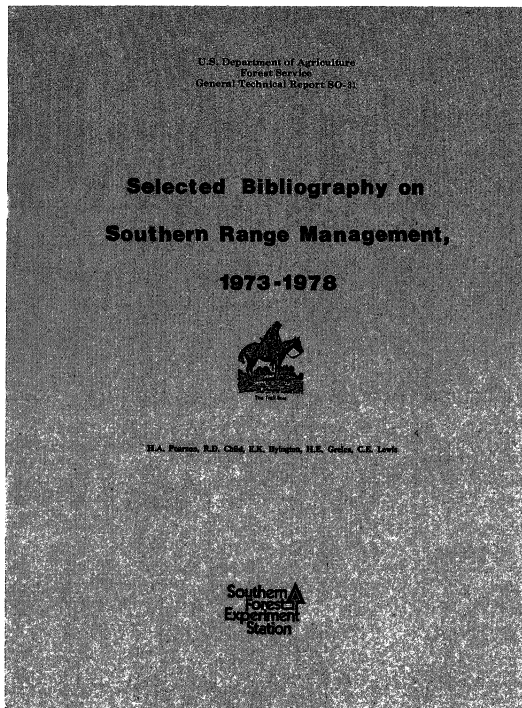
ENVIRONMENT

An innovative procedure was used to produce the 1980 *Selected Bibliography on Southern Range Management*, GTR-SO-31, fourth in a series that traces southern range management literature. A Southern Forest Experiment Station cooperator — Winrock International Livestock Research and Training Center — assembled citations into a computer-based bibliographic file. The file was then edited, updated, and indexed by a team of editors, librarians, range scientists, and technical information and computer specialists.

The 1980 publication appears similar to earlier issues in the series. Unlike manually produced versions, however, the author index, the keyword index, and the computer-produced, camera-ready copy were derived from the computer-based file. A searchable data base was also established, since the records are now part of CORR (Communications of Renewable Resources), an information resource available through Bibliographic Retrieval Services, Inc.

Now that the process is operational, it should find widespread application in other forestry and forestry-related fields.

ROUNDUP OF RANGE MANAGEMENT INFORMATION



PUTTING WILDLAND SHRUBS TO WORK

Many of our western rangelands have been drastically altered by human activities. Improper grazing, recreational activities, and surface mining, which can strip away vegetation or change the mixture of plants, have lowered the productivity of these lands. Erosion and flooding can follow such disturbances.

As researchers of the Intermountain Forest and Range Experiment Station develop methods to rehabilitate the western rangelands, they are seeking ways to improve the native shrubs and grasses. They are identifying natural genetic variations and selecting and developing the best varieties for specific uses.

For example, studies of sagebrush have indicated that some varieties are much better for certain uses than others. Some plants grow fast; others grow slowly. Using this information, land managers can plant one variety of sagebrush to enhance deer browse, but use another to heal highway scars.



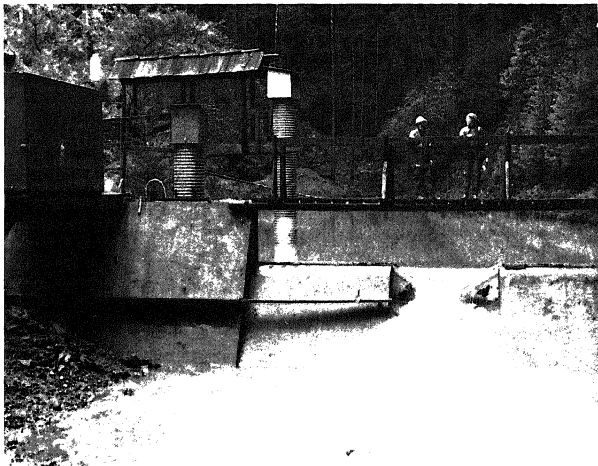
Big sagebrush (*Artemisia tridentata*) is an important native shrub of the West.

LOGGING INCREASES SEDIMENT BUT NOT FLOOD PEAKS

For years, much of the concern over possible adverse environmental effects of timber harvesting has centered on presumed increases in streamflow volumes and sedimentation in streams and rivers. The Pacific Southwest Forest and Range Experiment Station and the California Department of Forestry have recently published the results of a study giving important insights into these concerns.

The findings are based on 14 years of monitoring the Casper Creek experimental watersheds on California's north coast. Roads were built after a 5-year period of calibrating streamflow velocity and sedimentation. Four years later, about 64 percent of the 95-year-old, second-growth forest in the study area was selectively cut and removed by tractor. There was no detectable change in streamflow volume following road construction, but there was an 80-percent increase in sediment yield. After logging, only streamflow volumes less than 12 cubic feet per second increased significantly — peaks of this rate carry only 3 percent of the sediment. There was, however, a 275-percent increase in sediment yield during the 5 years after logging started.

Substantial increases in sediment discharge accompanied increases in streamflow velocity. Apparently, the principal effect of logging was the addition of eroded soil to the stream. These results strongly suggest that reducing erosion will reduce sediment from forested watersheds.



Researchers monitor streamflow following road construction and logging activities.



Large organic debris can serve a useful role in forest streams.

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A NEW LOOK AT TRENDS IN THE CAMPING MARKET

The popularity of camping and recreational vehicle travel continues to grow. According to a 1979 survey, camping ranks third in popularity, after swimming and bicycling, among outdoor recreation activities. Growth of the industry slowed in the 1970's, but franchised campgrounds provided an increased share of sites. A 14-percent decline in campground occupancy in 1979 appeared to be related to gasoline shortages. The 1980 season showed a partial recovery in occupancy rates in all sections of the country except the North Central States.

Northeastern Forest Experiment Station researchers are looking beyond numbers of visitors as the only measure of how well recreation resource managers are performing. Using a simple 2-to 3-minute "report card," distributed to a randomly selected group of campers throughout the season, a composite measure of camper satisfaction is generated from 14 elements of a campground visit. Campers rank each element from "A" (excellent) to "E" (poor). A scale is used to convert letter "grades" to scores, allowing easy detection of the slightest change in the satisfaction of campers visiting a given campground or all campgrounds in a park system. Tested at public campgrounds in three States, the system is now in its 4th year of operation at all New Hampshire State Park campgrounds.



Camping activities in the United States continue to grow.

DESCRIBING THE LAND

The northern Rocky Mountains are a patchwork of forests, shrublands, and grasslands. Potential uses (e.g., wildlife habitat, livestock forage) and species composition and productivity differ greatly among and within these major vegetation types.

To achieve multiple use planning and intensive resource management on these lands, forest managers are concerned with such questions as, "What are the productive capabilities of each vegetation type?" and "How will the land respond to various management activities?"

Intermountain Forest and Range Experiment Station researchers have provided some answers to these and similar questions in a habitat-type classification system for the grasslands and shrublands of western Montana. The system is the result of an intensive reconnaissance study. More than 350 stands — 289 in grasslands, 66 in shrublands — were sampled to develop the classification.

The land manager can use the system to predict management opportunities and consequences of selected actions. For example, although the Idaho fescue/bluebunch wheatgrass type is perhaps best suited for cattle production, the abundance of forbs in this type makes it acceptable for sheep range, too. The type is also widely used by big game animals, so the manager should be alert to potential conflicts between wildlife and livestock.



Mountain rangelands on the Gallatin National Forest in western Montana provide excellent grazing for livestock.

Many lands in the Eastern United States have been drastically disturbed by coal mining. The scars are evident on the sites of current surface and underground mining operations, as well as at unreclaimed abandoned mines and mine refuse piles.

To help reclaim these lands, scientists at the Northeastern Forest Experiment Station, in cooperation with the U.S. Environmental Protection Agency, have developed procedures for sampling, testing, and amending mine spoils. They have identified and recommended plant species and planting methods for erosion control and watershed protection, as well as for land uses such as timber harvesting and wildlife habitat. Many of the recommendations were obtained from information gathered during surveys of 30-year-old experimental tree plantings on strip-mine spoils in several Eastern States.

Their findings have been incorporated into a handbook that should be valuable to surface-mine operators, landowners, reclamation contractors, and land resource managers.



White birch grows on mine spoils in Pennsylvania.

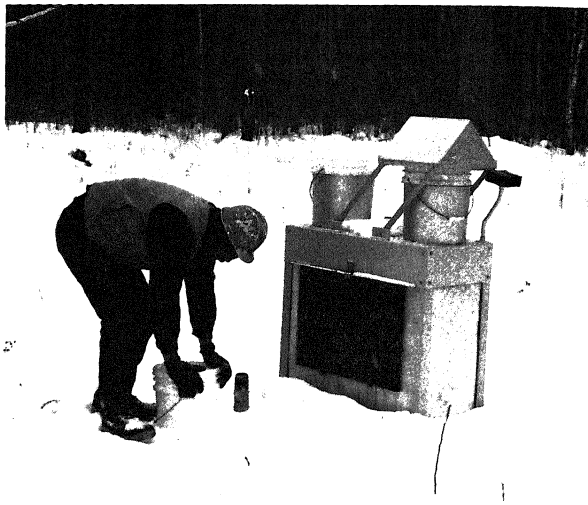
STINGING IN THE RAIN?

No, you can't actually feel acid in the rain yet, but its effects are there. The North Central Forest Experiment Station, in conjunction with the National Atmospheric Deposition Program, has been monitoring acid rain (and snow) in lower Michigan and north central Minnesota since 1978.

Because of certain weather patterns, most of the acid rain falling in the Lake States area comes from the Eastern United States. During winter and early spring, when the soil is wet or snow-covered, weather systems from the Eastern States circulate toward the upper-Midwest and deposit acid-laden rain or snow. This is when the lowest pH values of precipitation occur in the region. Then, in late June, when the soil is drying and cultivation begins, the eastern air is met by dust-filled, more alkaline air from the Great Plains that tends to neutralize the acidity and raise the pH. Thus, the Lake States become a battleground for the two air masses. Eastern air almost always wins in lower Michigan; Great Plains air almost always wins in southwestern Minnesota.

Large fluctuations occur in the northern part of the region. Studies of lakes in northern Minnesota show that those west of Arrowhead Lake have not been adversely affected by acid rain.

Other studies are aimed at determining the effect of acid rain on forest productivity.



Researcher monitors acid rain and snow in northern Minnesota.

VOICE PRINTING BALD EAGLES

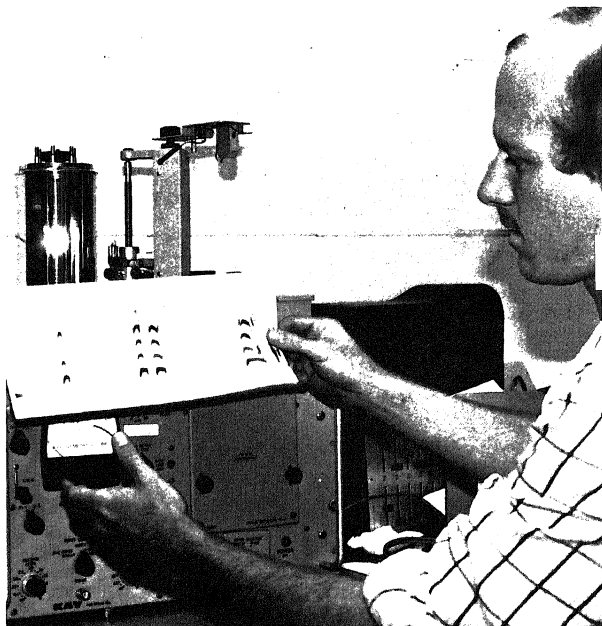
Information on survival rates, nesting territory, and possible changes in nest location in different years is vital to assessment of the stability of bald eagle populations. Traditionally, birds have been captured, marked, and released; this process risks injury to the birds.

Scientists at the Pacific Southwest Forest and Range Experiment Station are now able to identify and locate individual birds through their voice prints — sonagrams that produce audio-spectrographs. The audio-spectrographs can be compared visually and measured to determine duration, frequency, and amplitude of notes for a repertoire of calls.

The scientists have been able to characterize voice patterns of bald eagle pairs at nesting sites in northern California. The studies show that these patterns provide a way to identify individual birds through several breeding seasons. Voice printing also eliminates the risks associated with capture.

Results of tests over two breeding seasons indicate that an adult eagle's voice response to human intruders near the nest site is the most suitable call for voice print comparisons. Thus, it is not necessary to record each bird's full repertoire for accurate identification.

Using the voice-printing technique, ornithologists and wildlife biologists can assess breeding population and nesting habits more rapidly, at less expense, and with minimal disturbance to bald eagles.



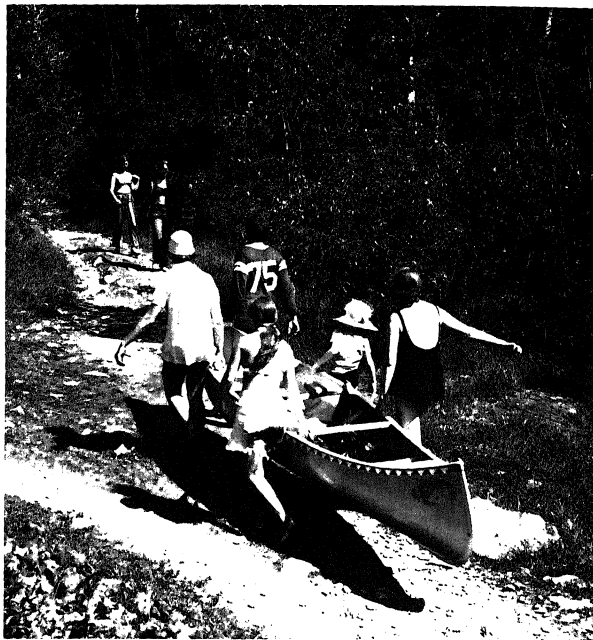
High-fidelity recordings of bird calls are fed into an audiospectrograph to produce a voice print or sonagram.

COMPUTERIZING THE BACKCOUNTRY

As the popularity of wildland areas grows, recreationists are encountering one another more and more. In environments where solitude is critical or where recreation facilities are inadequate for large numbers of people, use must be regulated.

Scientists at the North Central Forest Experiment Station and research cooperators at Northwestern University have developed a computerized mathematical simulation model that describes the travel behavior of campers in the backcountry. The model also shows how campsite use is affected by varying daily entry point quotas. Managers can thus experiment with different control strategies on the computer to pick the "best" one for actual use. The advantage of this approach is that congestion can be controlled, while allowing visitors free choice of travel routes and schedules once they have entered the area.

The model has been used in the Boundary Waters Canoe Area Wilderness in Minnesota and in the Quetico Provincial Park in Ontario. The method can be applied in any wildland area (such as on trails, rivers, lakes, and designated wilderness areas) to regulate campsite use without tampering with peoples' onsite activities.



Computer programs can help insure a pleasant experience in the backcountry.

A NEW WAY TO LOCATE GROUSE BROODS

In the past, grouse broods have been difficult to find. Today, however, wildlife biologists have a method to help locate ruffed grouse broods more efficiently and with less risk to the chicks. Grouse hens with broods can now be attracted to tape-recorded calls of a "lost" chick. Hens respond throughout the time they care for their broods.

Biologists must find the broods to manage populations and to assess habitat quality and devise forest management practices to improve it. The quality of grouse habitat may be the key to their production.

Scientists at the Northeastern Forest Experiment Station who developed the new method use it to determine whether grouse broods use various kinds of habitat and which kinds are best. They also use the recorded calls to capture and transplant birds. Individuals and agencies working with ruffed grouse have requested copies of the tape.



Researcher records the call of a ruffed grouse.



FIRE AND ATMOSPHERIC SCIENCES

About 9 percent of the land area in south Florida is burned each year — 95,000 acres by wildfires and 550,000 acres by prescribed fires. Are the prescribed fires achieving their objectives? What are the ecological effects of this burning? Resource managers and policymakers need answers to these questions to make decisions about fire use and control in the area.

The Southeastern Forest Experiment Station provides much of the needed information in a recent publication entitled *Fire in South Florida Ecosystems*, GTR-SE-17. This indepth report describes the changing environment of south Florida and outlines the history of fire in the area. The report reviews the available literature and relates the responses of 10 major natural vegetation types to changes in frequency and intensity of fire. The report also discusses the relationship between burning and the spread of three introduced species — melaleuca, Brazilian pepper, and Australian pine — important trees in many locations.

FIRE IN SOUTH FLORIDA ECOSYSTEMS



Cooling down a fire set to reduce the wildfire hazard and control the encroachment of exotic vegetation.

GOATS MAINTAIN FUELBREAKS

California has a special fire management problem — 4 million hectares of chaparral that is highly flammable when mature. A system of fuelbreaks is one method used to reduce the size and number of disastrous wildfires in chaparral. Fuelbreaks are wide strips of low-growing vegetation used to break up expanses of highly flammable vegetation. They also provide an area of relative safety from which firefighters can work.

The Pacific Southwest Forest and Range Experiment Station is investigating the use of goats to control regrowth of vegetation along fuelbreaks. Goats are less expensive and more environmentally acceptable than herbicides or mechanical maintenance methods. Although goats cannot effectively reduce mature chaparral stands, they can maintain brush in an immature stage after older brush has been cleared. The degree of browsing can be controlled by varying the herd size or by confining the goats within portable fences.

When confined within a limited area, goats will browse young sprouts of all chaparral species. If given a choice, however, they prefer some species over others. The goats are especially fond of birchleaf mountain mahogany and scrub oak, but unfortunately are not attracted to chamise or manzanita.

The use of goats as a biological method of brush control is still in an experimental stage in southern California's National Forests. Managers hope, however, that as problems are solved, goat grazing along fuelbreaks will become profitable for the herders and beneficial for the forests.

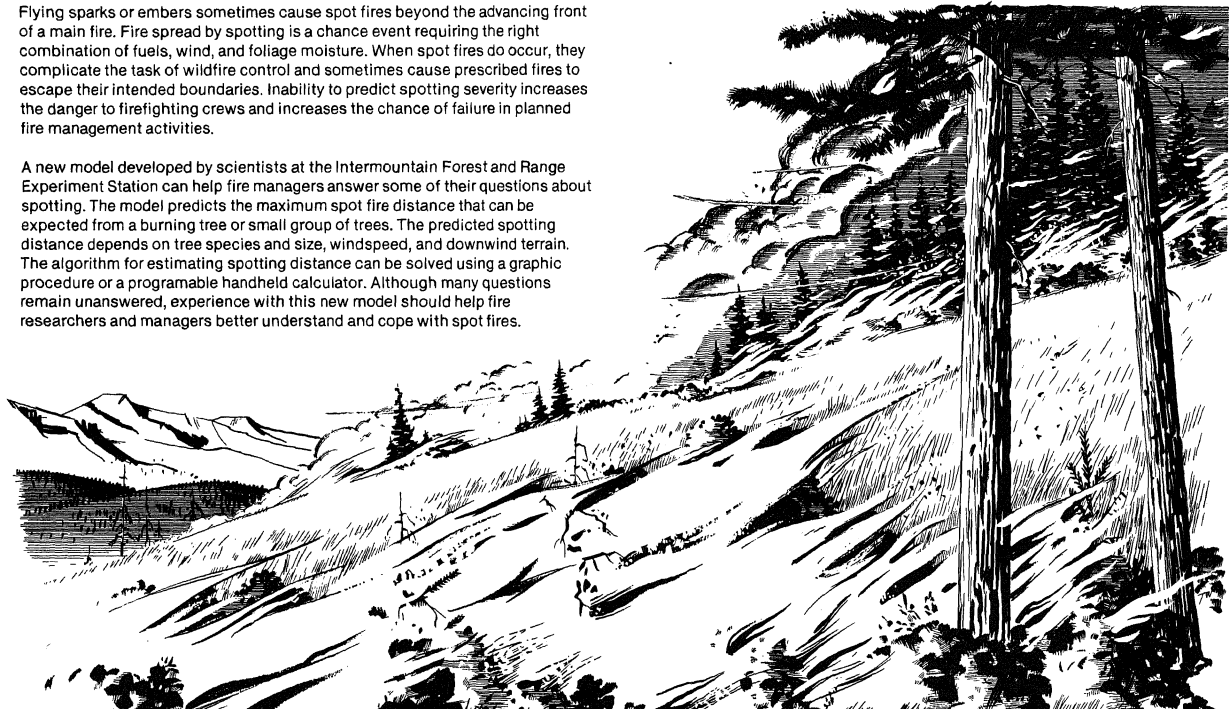


The use of goats as a biological method of brush control is being tested by researchers at the Pacific Southwest Forest and Range Experiment Station.

NEW MODEL PREDICTS SPOT FIRE DISTANCE

Flying sparks or embers sometimes cause spot fires beyond the advancing front of a main fire. Fire spread by spotting is a chance event requiring the right combination of fuels, wind, and foliage moisture. When spot fires do occur, they complicate the task of wildfire control and sometimes cause prescribed fires to escape their intended boundaries. Inability to predict spotting severity increases the danger to firefighting crews and increases the chance of failure in planned fire management activities.

A new model developed by scientists at the Intermountain Forest and Range Experiment Station can help fire managers answer some of their questions about spotting. The model predicts the maximum spot fire distance that can be expected from a burning tree or small group of trees. The predicted spotting distance depends on tree species and size, windspeed, and downwind terrain. The algorithm for estimating spotting distance can be solved using a graphic procedure or a programmable handheld calculator. Although many questions remain unanswered, experience with this new model should help fire researchers and managers better understand and cope with spot fires.



Lightning strikes, smoke curls upward, and fire sweeps through a stand of ponderosa pine in eastern Arizona. After the fire is out, foresters examine the scorched trees, deciding which ones are so badly damaged they should be salvaged for timber and which are most likely to survive. If too many potential survivors are cut, future timber yield may be reduced or seed trees that could regenerate the stand may be lost.

Although many factors influence the recovery potential of fire-damaged ponderosa pines, the two most important appear to be the season in which the damage occurred and the extent of damage to the tree crown. Differences in physiological condition and stage of growth make the trees more or less susceptible to fire damage during the growing season. Survival potential is further influenced by the extent of cambium damage, tree vigor, competition, insects, and moisture stress.

Rocky Mountain Forest and Range Experiment Station scientists analyzed these factors and how they interact to produce guidelines that foresters can use to improve their accuracy in marking only fatally damaged trees for salvage.



Estimating crown damage in fire-scorched ponderosa pine, Arizona.

EFFECTS OF FIRE ON WESTERN VEGETATION

Four Intermountain Forest and Range Experiment Station reports concerning the best use of fire to achieve management objectives in four major vegetation types of the West are now helping forest managers make informed decisions.

One report covers the effects of fire on vegetation in ponderosa pine communities. It includes sections on management implications and the state-of-the-art knowledge on using fire to manage these vegetation communities. The report is entitled, *The Effect of Fire on Vegetation in Ponderosa Pine Forests*, Texas Tech University Publication No. T-9-199.

Guidelines for conducting prescribed burns in sagebrush-grass and pinyon-juniper communities are presented in *The Role and Use of Fire in Sagebrush-Grass and Pinyon-Juniper Plant Communities*, GTR-INT-58. The guidelines are based on an extensive survey of literature and practical field applications.

The Role and Use of Fire in the Semidesert Grass-shrub Type, GTR-INT-85, can be used by managers to develop specific management procedures in the southern desert grasslands.

Fire Ecology and Prescribed Burning in the Great Plains, GTR-INT-77, contains vegetation descriptions and fire effects data for the shortgrass, mixed grass, and tallgrass prairies in the southern, central, and northern Great Plains. Guidelines are provided for all major vegetation types where prescribed burning data have been collected.



Balsamroot and lupine make up a large component of the herbaceous yield in this three-tip sagebrush community. Fall burning would help maintain the forb component.

HISTORICAL WEATHER DATA HELP FIRE MANAGERS PLAN FUTURE

Wildland fire management is complicated by uncertainty about weather conditions that can strongly influence fire behavior. To plan for fire operations, managers rely on historical weather records to gain insight about likely future conditions. But managers find it difficult to translate the great volume of historical weather data into an optimal management strategy.

Help has been provided by Rocky Mountain Forest and Range Experiment Station scientists who have developed two analysis aids for planning the use of prescribed fire from either natural or planned ignitions. The first synthesizes weather data into fire planning statistics that show when burning conditions are most likely to be within specified safe limits. The second provides information about the occurrence of atmospheric conditions that favor good smoke dispersion during prescribed fires. With these aids, fire managers can answer questions such as:

- "How many days can be expected to meet prescribed weather conditions?"
- "During what parts of the year are prescribed weather conditions most likely?"
- "What is the chance of several favorable burning days occurring in succession?"

These planning aids for Forest Service and other land management personnel are available as computer programs maintained at the U.S. Department of Agriculture Computer Center in Fort Collins, Colo.



Starting a prescribed fire under carefully specified fuel and weather conditions.



INSECTS AND DISEASE

Researchers at the Intermountain Forest and Range Experiment Station have developed timber harvesting prescriptions that will help save lodgepole pine stands from devastation by the mountain pine beetle.

Past studies have shown that the use of chemicals and massive timber salvage operations will not alter the course of a mountain pine beetle epidemic or reduce the loss of trees. Recent research indicates that the key to managing this destructive forest pest is preventive action *before* the outbreak of an epidemic. The mountain pine beetle prefers large trees with thick phloem. When these trees are removed from a stand, the beetle's food supply is reduced and the population cycle, which eventually leads to epidemic outbreaks, is interrupted.

The preventive prescriptions show strong promise as a method of warding off beetle infestations. Controlling these infestations will help insure future timber supplies and protect other resource values such as esthetics, forage, and wildlife habitat.

STARVE THE BEETLES — SAVE THE TREES



Researchers have developed cutting strategies to prevent kills by the mountain pine beetle.

Fast work by insect control specialists and Southeastern Forest Experiment Station entomologists is minimizing damage by a new pest of white pines in the southern Appalachians. This pest, called the introduced pine sawfly, was first found in the United States early in this century. It spread through the Northeast and Lake States, but did not move into the South. In 1977, however, it was discovered in western North Carolina. The sawfly is capable of killing or severely damaging white pines, which contribute much to the esthetics of the southern Appalachians. Christmas tree plantations, representing large investments, are also threatened. Fast action was needed to determine the size of the infested area and to develop a satisfactory method of control.

Traps designed to lure and capture male sawflies were deployed in white pine stands in North Carolina, Tennessee, and Virginia. The traps contained a sex attractant or pheromone that Station entomologists extracted from virgin female sawflies. Using this procedure, the scientists determined that about 6,000 square miles are now infested — a big increase in the last year.

Examination of sawflies captured in North Carolina showed that parasitic insects that help control them in the Lake States were absent in the South. Two species that help keep introduced sawflies in check in Wisconsin were brought to a specially equipped laboratory at Linville Falls, N.C., in the spring of 1980. By August 1, approximately 100,000 of these parasites had been reared and released.

It is too early to know what the full effect of these "imported" parasites will be, but entomologists are convinced that growth of the sawfly population has been slowed. The parasites have already caused a 10-percent increase in the mortality of the sawflies. Since the parasites are effective in the North, scientists believe they will also control sawflies in the southern Appalachians.



The pine sawfly can severely damage and kill white pines.

IDENTIFYING YELLOWS TYPE DISEASES IN FOREST TREES

In 1967, Japanese scientists startled the scientific world by reporting the discovery of a link between certain yellows diseases and mycoplasmas. In some respects, mycoplasmas are micro-organisms intermediate between viruses and bacteria. Although mycoplasma-caused diseases of animals had been known since 1895, no one suspected that they could cause plant diseases. The Japanese finding spurred new research to determine the possible relationships between mycoplasmas and certain important forest tree diseases.

At the Northeastern Forest Experiment Station, Forest Service scientists conducted an extensive series of cytological investigations. Their research has produced the first scientific reports of mycoplasma-caused diseases of native forest trees. The scientists have identified the presence of mycoplasmas in the phloem of elm with phloem necrosis disease, walnut and pecan with bunch disease, and black locust with witches'-broom disease. These yellows-type diseases are characterized by an overall yellowing and dwarfing of foliage or by the development of witches'-brooms in tree crowns. Of the four diseases studied, natural transmission by an insect is known only for elm phloem necrosis; all four diseases can be experimentally transmitted by grafting.

Research is continuing to develop a better understanding of pathologic activities in diseased tissues, to discover new disease-transmitting insects, to develop selections and hybrids of elm resistant to elm phloem necrosis, and to develop methods to control these diseases.



Elm phloem necrosis has caused widespread damage in the eastern United States.

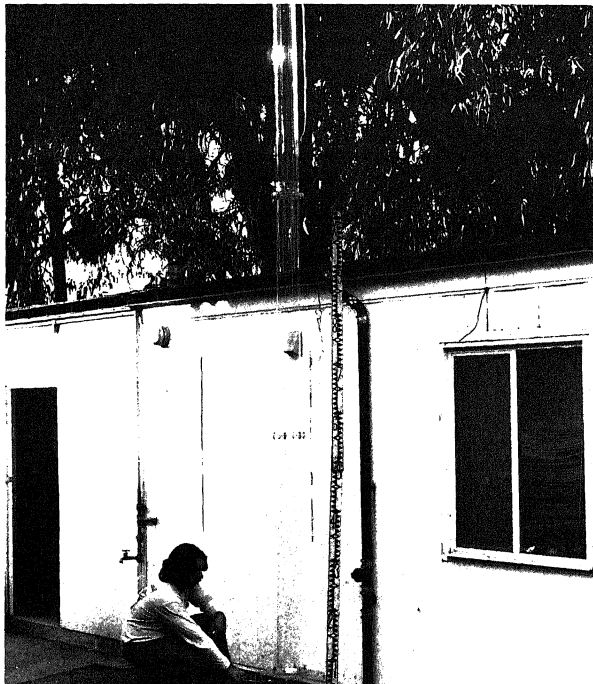
HEAT-SHOCK FUNGI MAY STABILIZE SOIL

Excessive erosion and its associated flooding are a common occurrence following fires in California's chaparral. Erosion rates up to 35 times the normal can be expected in these areas during the 1st year following a fire. Such erosion is a serious problem — over half of California's major urban areas lie in or adjacent to the chaparral zone. Federal, State, and local agencies spend millions of dollars each year on erosion control and land rehabilitation.

Within a few days after a fire, several species of microfungi have been observed growing over and through the soil — higher soil temperatures during the fire caused their spores to germinate, and competition from other organisms was removed by the fire. The mycelium (threads) of these fungi might stabilize freshly burned soil by binding together soil particles. Thus, the soil would be more resistant to erosion by raindrop impact, one of the most powerful eroding agents on burned slopes.

To test this theory, scientists at the Pacific Southwest Forest and Range Experiment Station added the fungus *Aspergillus fischeri* var. *glober* to soil exposed to rainfall. Results show distinctly lower erosion rates in soil containing the fungi than in sterile soil. Four other naturally occurring species of fungi are also promising.

This research is the first of studies designed to determine whether naturally occurring heat-shock fungi help reduce erosion caused by raindrop impact, to evaluate the significance and extent of their role, and to determine if erosion can be further reduced by adding fungus spores to erosion-susceptible areas.

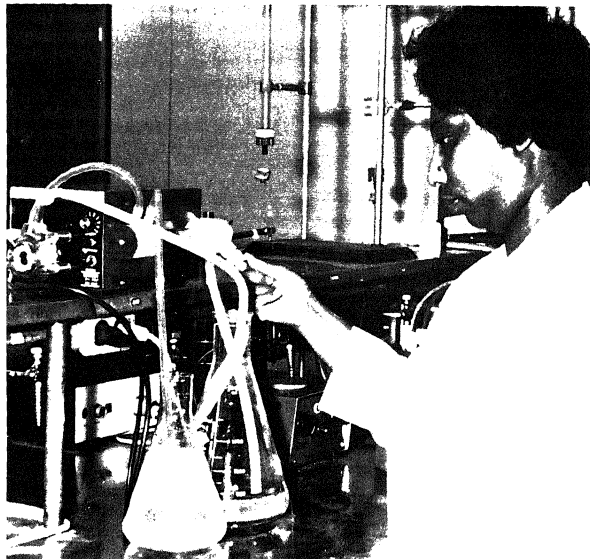


SCIENTISTS DISCOVER A NEW MULTIFUNCTIONAL ENZYME SYSTEM

Researchers at the Forest Products Laboratory have isolated and identified an unusual enzyme system from a wood decay fungus. The fungus, *Poria placenta*, produces a group of enzymes capable of breaking apart complex carbohydrates as well as short-chain sugar molecules. Such a multifunctional capacity in an enzyme system has previously been unknown.

Moreover, unlike most other systems, which stop producing additional enzymes when the end product (i.e., simple sugars) is created, the production of additional enzymes by this fungus is not inhibited. Therefore, the fungus can continually synthesize the appropriate enzymes and produce large amounts of simple sugars from complex carbohydrates such as cellulose. Although additional research is needed, the ability makes possible a scheme for continuous conversion of wood to simple sugars.

Information on how fungal enzymes decay wood is critical to the development of nontoxic means of controlling such fungi by inhibiting enzymatic action. In this instance, the information might also be applied in the fungal conversion of wood waste to energy sources (alcohol) or to livestock feeds.



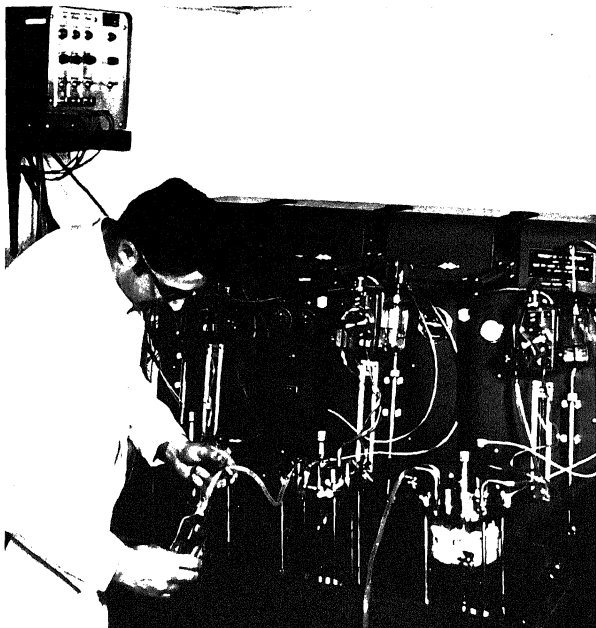
Ultrafiltration equipment is used to separate and identify enzymes that cause deterioration of wood.

Bt IMPROVEMENTS FOR PEST MANAGEMENT

The use of biological control measures, primarily microbial, in the management of gypsy moth and spruce budworm pest populations is a primary goal of the Northeastern Forest Experiment Station. Past research on microbial materials, particularly the bacterium *Bacillus thuringiensis* (Bt), had indicated tremendous potential, but attempts to control these pests in the forest with Bt often produced erratic results.

New research conducted at the Hamden Forest Insect and Disease Laboratory has identified several new strains of Bt (commercially unavailable) that exhibit much higher levels of activity than the commercially available bacterial strain. The new strains appear to be 2 to 20 times more potent against gypsy moth and spruce budworm larvae. Commercial interests are eager to make these new strains available for field tests.

As far as we know, the Hamden unit is the first to identify Bt strains that are more active against gypsy moth. Although field success must still be demonstrated, the discovery and use of these more potent strains may mean more effective and uniform control of gypsy moth and spruce budworm.



A fermentor is used in the production of improved Bt strains.



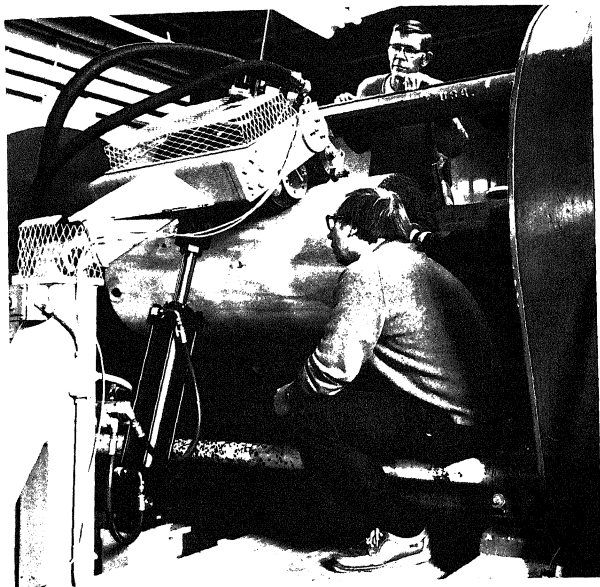
PRODUCTS AND ENGINEERING

Powered backup rollers developed at the Forest Products Laboratory are designed to eliminate spinout on veneer lathes. The powered backup device, a set of two hydraulically powered rollers, turns against the outer surface of the log as it is peeled and helps the chucks provide torque. Chucks are devices that hold and turn the log against the veneer knife. Constant pressure from a hydraulic cylinder holds the backup rollers against the log.

Spinout occurs when the amount of lathe torque created by the cutting knife exceeds the strength of the wood at the ends of the log. When that strength is exceeded, the wood fails and the lathe chucks spin free, rendering the log useless for veneer peeling. Spinout now occurs with 5 to 8 percent of the logs peeled for veneer. Since plywood, made from veneer, accounts for 80 percent of the value of all United States panel products, spinout represents a significant loss of valuable timber.

Logs with soft centers, once considered unpeelable, can now be used. The backup rollers also allow the use of smaller lathe chucks; this reduces the core diameter, thus increasing the veneer yield per log. The new process will also facilitate peeling thicker veneers, which can be used in products of the future.

POWERED BACKUP ROLLERS SAVE VENEER



Researchers check alignment of powered backup roll equipment before making a trial veneer peeling.

PREDICTING MILLWORK AND MOLDING PRODUCT YIELDS

Despite high prices for the final product, lumber grades suitable for millwork and molding products are always in short supply. About 1.3 billion board feet are needed each year for these products that include cabinets, doors, window frames, and other finish woodwork.

Researchers at the Forest Products Laboratory and the Pacific Northwest Forest and Range Experiment Station have developed and tested a computer program to predict the yield of these high-value products from mixed and lower grades of lumber. The new method shows that more lower grade, less expensive material can be used, enabling mills to alter their mix of lumber grades to suit market conditions.



Forest Service crew measures and records board information for computer processing.

REFERENCE BOOK WILL HELP USERS OF TROPICAL TIMBER

The physical and mechanical properties of 370 tropical species from America, Africa, Southeast Asia, and Oceania are compiled, evaluated, and interpreted in an 830-page book, *Tropical Timbers of the World*.

Properties are categorized and cross-referenced to permit comparison of woods and to relate woods to specific uses. Primary users of the book will be industrial manufacturers and marketing specialists seeking sources of wood from among the hundreds of tropical species. The book will also serve as a major reference for scientists and educators who need a comparative base for specific technical analyses.

The book is available from National Technical Information Service, Springfield, Va. 22161. *Tropical Timbers of the World* ADA 086073: hard copy; microfiche.



Researcher views samples of tropical woods representative of many described in new publication.

Timber harvesting is the most significant management tool available to forest managers. Intermountain Forest and Range Experiment Station researchers, working with resource managers, have evaluated alternative timber harvesting practices that will help maintain productive forests.

The results of several years of research and the proceedings of a symposium are published in *Environmental Consequences of Timber Harvesting*, GTR-INT-90, a 526-page compendium. The report summarizes most of the available information on alternative timber harvesting practices in the northern Rocky Mountains. This compendium answers questions on esthetics, fire management, insect and disease control, stand regeneration and development, and other forest management concerns.

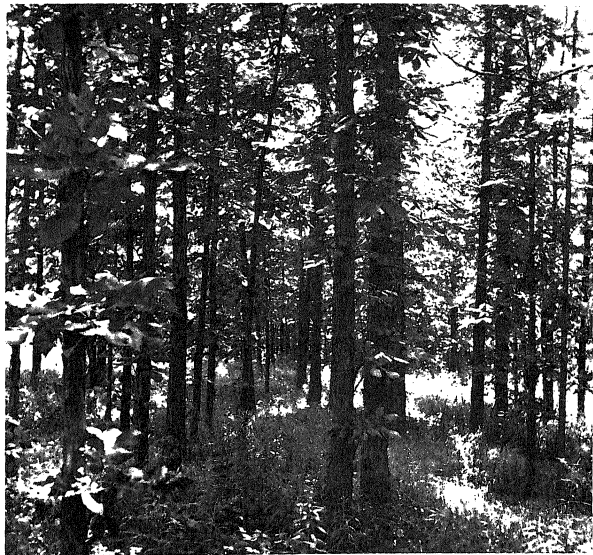


Researchers are investigating the environmental and management consequences of carrying out intensive wood fiber utilization with methods such as this skyline yarding system.

PREDICTING PRODUCT POTENTIAL OF YOUNG HARDWOOD STANDS

In order to evaluate the effects of various cutting methods, forest managers need to be able to estimate quality development, as well as growth, in potentially high-value hardwood stands. Results of a study conducted at the Northeastern Forest Experiment Station show that the individual tree characteristics important in predicting product potential and quality can be measured and combined to describe a tree or stand.

By measuring or estimating tree size, crown ratio, stem curvature, and limb-related and other defects, numerical summaries can be produced that predict the quality potential of young stands. Researchers use these summaries to identify and classify the quality of trees on research plots. They can then predict the change in quality characteristics over time and relate it to changes in product potential.



It is important to be able to estimate quality development as well as growth in hardwood stands.

Research engineers at the North Central Forest Experiment Station have developed a chipping machine that produces chips or chunks of wood 2 or 3 inches long. The material can be used for exterior grade structural flakeboard or for fuel.

Chips from conventional machines are too small to be converted to flakes for structural material. The new chipper, with a spiral cutting blade, converts small trees and residue into 2½-inch chunks that can then be ring-flaked to the required size.

Further trials have revealed another, perhaps more important, use for the larger chips or chunks. Their size gives them certain advantages over conventional pulpwood chips for fuel. For some types of industrial combustors, the chunkwood produced by the spiral-head chipper may be cheaper to produce and easier to store and handle. It may also dry better, burn better, and mix with coal better. A portable model can be mounted on a tractor, thus logging residue that otherwise might be wasted can be used. The chunkwood chipper can also serve as a compact low-cost machine for the farmer or woodlot owner in managing timber and producing fuel for home use.



Spiral-headed chipper produces chunks instead of chips, which may be better for flakeboard and fuel.

A NEW CABLE YARDER FOR STEEP TERRAIN

In the past, small tracts of timber growing on steep Appalachian slopes have remained almost totally inaccessible for harvesting. With the world's demand for forest products growing every year, such timber can be a valuable contribution to that demand.

Researchers at the Northeastern Forest Experiment Station have developed a new cable yarder, the Appalachian Thinner, that can be used efficiently to harvest trees on small woodland properties. The low-cost yarder can buck (cut trees into log lengths), yard (concentrate the logs in one location), and deck (load) as many as 40 tree-length logs in an 8-hour period. The Appalachian Thinner does not require guylines and can be transported on a 10-ton trailer, thus it can be moved easily within a timber tract.

The Appalachian Thinner is an answer to the need to remove selected timber from steep, small woodland areas at a reasonable cost.



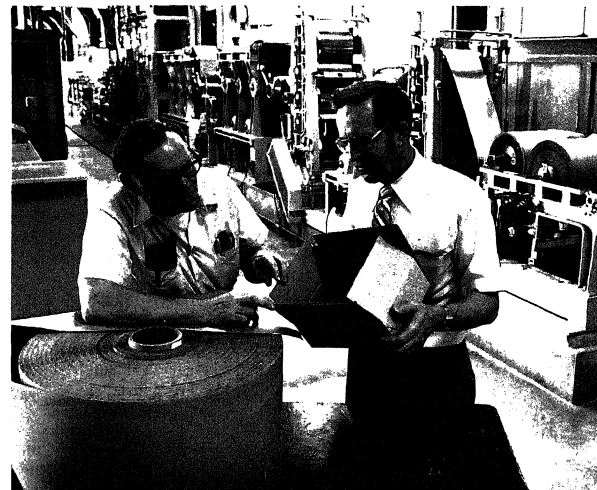
This new cable yarder can be used efficiently and economically on small woodland properties.

Press drying, a revolutionary concept developed at the Forest Products Laboratory, allows paper manufacturers to use, for the first time, 100-percent hardwood pulp for linerboard. The concept will also relieve the pressure on the softwood timber supply. Over one-half the timber harvested in the United States goes into paper manufacture. Of this, one-half is used to produce linerboard, the structural outer surface of corrugated boxes.

Using heat and pressure to bond pulp fibers together, press drying eliminates the need for longer, but scarcer, softwood fibers for the strength required for conventional linerboard. In addition, less refined, higher yield pulp (60 to 70 percent or higher) can be used without sacrificing product performance. Conventional processes use pulp with yields of around 53 percent.

Press drying also saves energy — the pulp needs less refining and the paper sheet requires less drying time.

The demand for softwood timber, preferred for lumber and pulp manufacture, has increased in recent years. But the demand for hardwood timber is less, thus surplus supplies of these species are available, particularly in the Eastern United States.



Researchers examine a sample corrugated fiberboard box made from 100-percent hardwood (red oak) pulp.



RESOURCE ECONOMICS

There's a lot of raw material in stands of dead lodgepole pine in the Blue Mountains of eastern Oregon, and it's worth going after.

Researchers at the Pacific Northwest Forest and Range Experiment Station and the Forest Products Laboratory have evaluated this area, which contains approximately 12 million tons (dry basis) of standing lodgepole pine killed during a bark beetle epidemic in the 1970's. Although some of the dead timber is low in quality and has limited potential for conventional products, it can be used for fuel or chip products.

Results of the study show that the overall energy input to harvest, transport, and deliver the wood as fuel, within a radius of 125 miles, is less than 5 percent of the gross energy content. In terms of comparative energy value, chips from these dead trees can be delivered, within the same distance, at a cost considerably cheaper than oil. Paper mills, board plants, and producers of chip products, however, might pay higher prices for chips as raw material than those who use chips as fuel.

Experimental harvesting operations indicate that whole-tree chipping of the dead lodgepole pine would be the cheapest harvesting method.

DEAD TREES IN OREGON A VALUABLE RESOURCE



Researchers at the Southern Forest Experiment Station have developed a method to speed the inventory of Midsouth forests. They have integrated electronic components into a system that not only saves time, but is also more accurate and minimizes paperwork.

Continuous multiresource inventory of Midsouth forests requires the recording and processing of more than 2 million observations from field plots annually. In the past, each entry was manually recorded on a tally sheet, visually checked, and mailed to unit headquarters for keypunching, verification, and submission to a computerized edit program for error detection. This procedure usually took about 3 months, and timely advice to field crews about error sources was virtually impossible.

Field crews can now punch entries into a handheld data recorder — a device similar to that commonly used by supermarket stock clerks. Each recorder holds up to 16,000 characters of information — the equivalent of data entries from five field plots. Once recorded, the data are electronically converted to audible signals and transmitted by telephone line to headquarters where data-acquisition equipment receives and magnetically stores the information. After being edited, results can be transmitted back to the field where a portable terminal receives and prints the data for review by crew leaders who discern sources of errors and inconsistencies.

The new system will help attain the Station's goal of reducing the seven-State inventory to a 5-year cycle.



Electronic data recorders are used to collect timber stand data in Southern Forest Experiment Station surveys.

What domestic and foreign factors affect the Nation's supply and demand for insulation board, hardboard, and pallets? Researchers of the Northeastern Forest Experiment Station have developed econometric models that answer this question. These models can be used to help provide market information on future consumption and prices of these products.

The models mathematically explain the supply-demand interrelations within each market and provide flexible techniques for annual consumption and price forecasts. They add clarity, objectivity, and flexibility to the study of wood products markets. Users of the models can measure the cause and effect of market changes.

These data are valuable to decisionmakers when formulating forest policies and programs, establishing longrun timber production and multiple-use goals, and assessing the domestic impact of export and import questions.

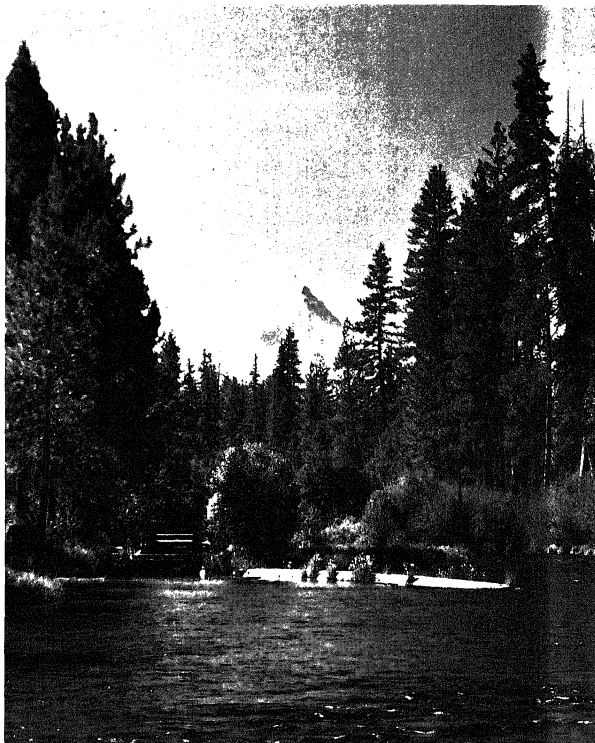


Better market information promotes orderly marketing and greater efficiency in product supply.

What is an attractive forest landscape worth? While it is naturally impossible to estimate that worth, researchers at the Pacific Northwest Forest and Range Experiment Station can determine the increase in management costs for a more attractive view.

Lands on the Mt. Hood National Forest in Oregon, designated for esthetic consideration, produce the same amount of wood as standard timberlands. Additional costs are incurred, however, if managers take other measures to enhance the landscape. Such measures could include more thorough cleanup of debris and using more costly logging methods that create little adverse visual impact.

The researchers found that this increase in cost is equivalent to approximately \$2.00 per acre each year for the more attractive landscapes throughout the life of these forests. If this degree of esthetic protection is included in the cost of growing and producing timber, it represents about a 14-percent increase in direct costs.

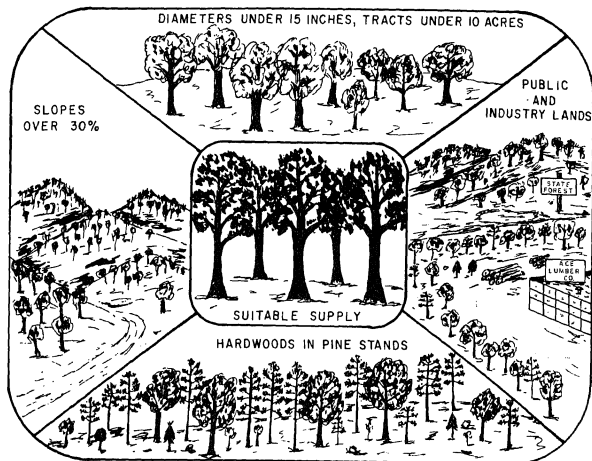


It costs more to maintain an attractive forest landscape.

CUSTOMIZED INFORMATION FOR HARDWOOD MANUFACTURERS

In recent years, forest survey reports for Southeastern States have presented an optimistic picture of hardwood timber inventories — quality and quantity appear to be increasing. Yet many hardwood manufacturers find it more and more difficult to get logs of the species, size, and quality they need. This contradiction may be caused by specialized needs of individual manufacturers and by timber stand qualities that affect availability. Resource analysts believe that the situation can best be analyzed by special computer screenings of inventory data based on tree and stand qualities described by individual manufacturers.

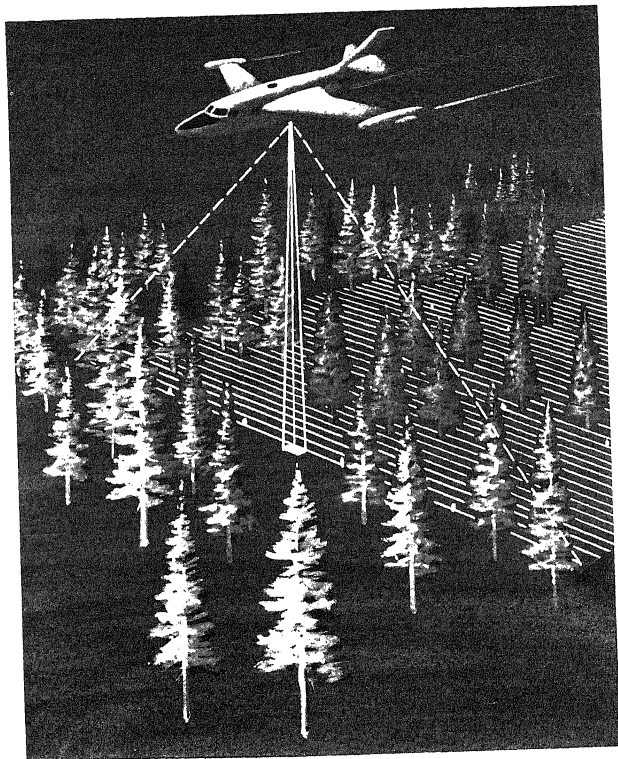
Consider the hypothetical example of a manufacturer of oak furniture in High Point, N.C. The Resource Bulletin for the Piedmont Plateau in North Carolina (RB-SE-32) shows 2,425 million board feet of select oak sawtimber in the region. That figure, however, reveals little about quality and nothing about availability. Furniture manufacture may require logs from trees at least 15 inches in diameter usually found in hardwood stands 60 years of age or older. Furthermore, slopes greater than 30 percent may be too fragile for logging. We might assume that timber on public lands and on lands owned by other wood-using companies is not available. Finally, we may wish to exclude private tracts smaller than 10 acres because they offer poor logging opportunities. By computer screening resource data gathered by forest inventory crews, the manufacturer learns that there are 443 million board feet of select oak sawtimber on the Piedmont Plateau that meet the specified needs.



Hardwood manufacturers can benefit from customized information about timber inventories.

A new Rocky Mountain Forest and Range Experiment Station report makes it easier for land managers and inventory planners to select the best remote sensing techniques for their particular needs. Remote sensing is the detection, recognition, or evaluation of objects by means of distant recording devices. An astronomical telescope, an aerial camera in a supersonic jet aircraft, or a sonar installation in a submarine are all forms of remote sensors.

Scientists at the Station evaluated the characteristics of most remote sensing media, including photographic and nonphotographic data such as microwave, radar, thermal infrared, ultraviolet, and multispectral scanner data. The information is included in *Remote Sensing of Wildland Resources: a State-of-the-Art Review*, GTR-RM-71. Descriptions of the information sources in the report enable users to evaluate application to wildland management.



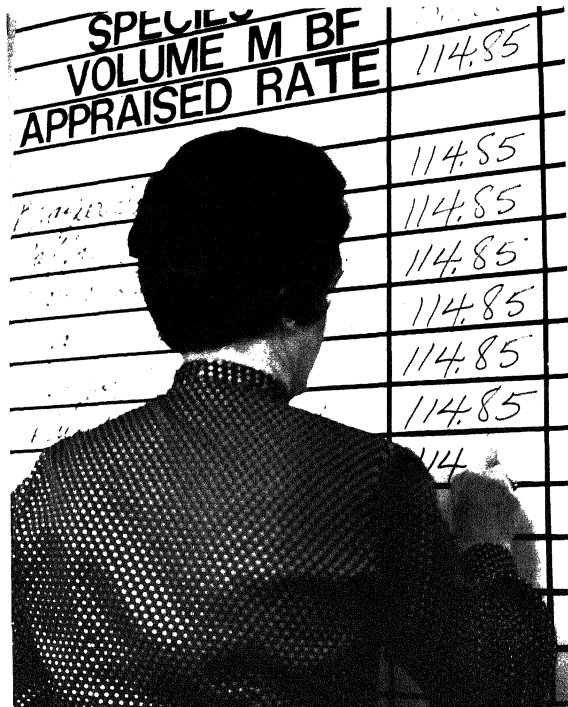
Satellite photos are one of the many remote sensing tools available to resource managers.

WHAT ABOUT NATIONAL FOREST TIMBER SALES?

The public is asking questions about National Forest timber sales procedures. Are the timber purchasers getting a fair deal? Do payments to the U.S. Treasury for timber reflect its true value? Scientists at the Pacific Northwest Forest and Range Experiment Station are trying to answer some of these questions by analyzing National Forest System timber sales data.

The Small Business Administration "set-aside" program is designed to provide special opportunities for small forest industries to compete for timber from the National Forests. An analysis of this program in the Douglas-fir region revealed that it provided a subsidy to small forest industries only in southwestern Oregon. Elsewhere in the region, both regular and set-aside timber sales had comparable prices.

The scientists also analyzed sealed versus oral bidding for timber sales in the Northern, Pacific Southwest, and Pacific Northwest Regions. For areas or types of sales characterized in the past by relatively little competition, the number of bidders and the price of timber increased when oral bidding procedures were changed to sealed bidding. Results of this research will be useful in shaping policies affecting National Forest timber sales.



Board is prepared for an oral bid timber sale, but higher prices may come from sealed

FOREST LAND OWNERSHIP SHIFTS

The conversion of rural lands to other uses, particularly urban-oriented ones, is a continuing concern in the United States.

Pacific Northwest Forest and Range Experiment Station researchers analyzed private land ownership and use changes in western Oregon between 1962 and 1975. They found that approximately 210,000 of the 6.4 million acres of timberland in the area were converted — primarily for pasture and other agricultural uses. During this same period, the forest industry purchased 80,000 acres of timberland — mostly from farmers and other private owners. (Although this land did not contain large volumes of timber, it had higher than average tree-growing potential (site quality). As a result of these shifts in land ownership and use, forest industry timberland area has increased 7 percent, while farm and other private timberland area has decreased 15 percent.



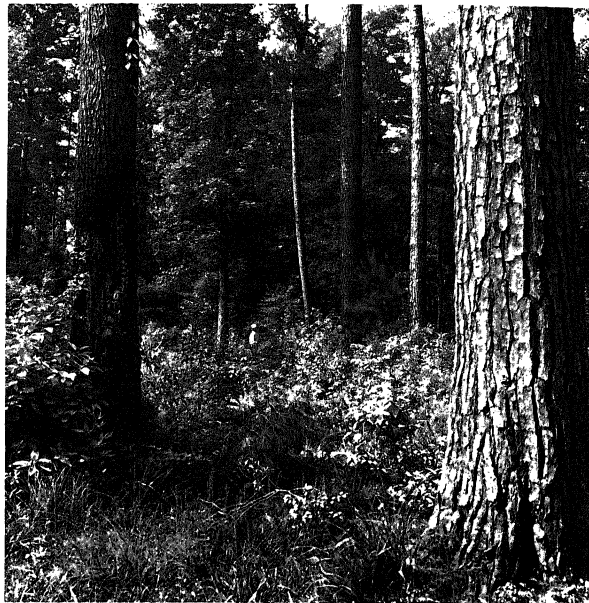
Small timber tracts in western Oregon are being converted to other uses.

FOREST LANDOWNERS CAN SAVE ESTATE TAXES

Death taxes, once of little concern to most nonindustrial landowners, have received increasing attention in recent years. Rising property values and inflation have made the Federal estate tax, in particular, a significant item for many people — including timberland owners. When a forest landowner dies, heirs often have to harvest timber prematurely or are forced to sell part or all of the land to pay estate taxes.

The 1979 Tax Reform Act contains features designed to lower Federal estate taxes. It provides an opportunity to reduce, in certain situations, estate taxes on real property held jointly by husband and wife. The procedure involves making lifetime gifts between spouses of the jointly owned property rights.

Using a realistic forest ownership example, researchers from Oregon State University and the Southern Forest Experiment Station analyzed the application of this legal provision to timberland owners and showed how a spouse could save over \$33,000 in estate taxes. Proper use of these techniques can reduce the need for liquid assets at death and thus lessen disturbance to the continuity of forest ownership and timber management.



Sound estate and inheritance planning is extremely important if heirs are to retain valuable forest lands.



TIMBER MANAGEMENT

Short rotation, intensive culture (SRIC) of fast-growing poplars could help the forest products industry solve the problem of a dwindling land base. Wood produced from SRIC plantations is also suitable for conversion to energy and many useful chemicals. Research at the North Central Forest Experiment Station shows that yields three to four times that of natural, unmanaged forests can be obtained from hybrid poplars planted in cultivated, fertilized, and irrigated plantations. Such a system is energy efficient, with an energy output/input ratio for the harvested and chipped poplar of 9.6.

Research on genetic improvement of poplars at the North Central and Southern Forest Experiment Stations shows that wood quality and yields can be enhanced. For example, important properties such as color, specific gravity, fiber length, and fiber-vessel ratio can be tailored for a specific mill and location by carefully selecting particular hybrids. Eight new selections for the Mississippi Delta show greatly increased growth compared with existing, improved eastern cottonwood strains. These superior strains will be produced in several State forest nurseries for public distribution.

About 13 million acres, mostly marginal farm land, are available in the northern one-third of the Lake States for short rotation, intensive culture of hybrid poplars. Additional land is suitable for planting fast-growing eastern cottonwood strains in the Mississippi Delta region.

FAST-GROWING POPLARS FOR FIBER AND ENERGY



Studies on genetic improvement of poplars show that wood quality and yields can be

MORE FAST-GROWING TREES

In addition to studying hybrid poplars in the Lake States and the Mississippi Delta, Forest Service researchers are testing fast-growing eucalyptus species in the warm tropical environments of southern Florida and Hawaii. Eucalyptus wood can be used for paper production, but use as a substitute for fuel oil in the boilers of citrus concentrating plants or electric generating plants seems more likely.

Scientists from the Southeastern Forest Experiment Station have shown that *Eucalyptus grandis* will produce about 3 cords per acre per year on land that is currently unproductive. Over 12,000 acres of commercial plantations have already been established and as much as 3 million acres in the southern half of Florida may be suitable. Much of this land is now used as unimproved pasture, but the soil is so low in nutrients that about 30 acres are needed to support one cow.

Researchers at the Institute of Pacific Islands Forestry of the Pacific Southwest Forest and Range Experiment Station are developing guidelines for establishing, cultivating, and harvesting plantations of eucalyptus. In studies funded by the U.S. Department of Energy, scientists have shown that closely spaced, fertilized trees can grow 35 feet high in 3 years. Tests have also been conducted using a combination of eucalyptus wood chips and bagasse, a byproduct of sugarcane production, to fuel boilers. Wood chips may soon be used to supplement or replace oil and other expensive fossil fuel, which Hawaii must now import to produce electricity.



CLASSIFYING VEGETATION IN THE 49th STATE

Scientists at the Pacific Northwest Forest and Range Experiment Station have developed a classification system for Alaskan vegetation to assist resource managers in long range planning and development of suitable land management strategies.

The publication, *A Preliminary Classification System for Vegetation in Alaska*, GTR-PNW-106, is the result of a 4-year research effort. The classification is now used by Federal and State agencies involved in inventory and mapping of vegetation in Alaska.

The classification system has five levels of complexity. The first, or broadest, level has five categories: forest, tundra, shrubland, herbaceous vegetation, and aquatic vegetation. Each of these broad categories has four additional descriptive levels. At the most detailed level, 415 plant communities are described by the dominant species in the tree, shrub, and herb layers. The system will be revised at frequent intervals as more is learned about the vegetation in our Nation's largest State.



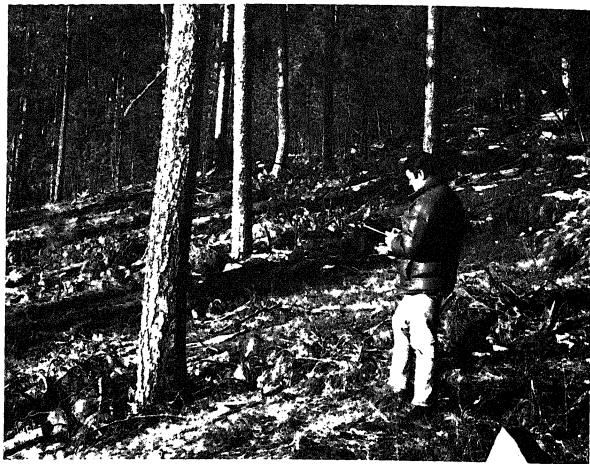
Open conifer-birch and bogs in southwestern Alaska are a major vegetation classification.

TREES AND WATER TOO

The Black Hills, heavily forested with ponderosa pine, are the source of most of the water for the surrounding Great Plains in South Dakota and Wyoming. Proposed development of coal fields in the area will cause serious conflicts, as water yields barely meet current needs.

Scientists of the Rocky Mountain Forest and Range Experiment Station believe they have found a way to reduce these conflicts. Thinning dense pine stands on the Sturgis Experimental Watershed in Wyoming increased water yields by nearly a third, while water quality remained excellent. As an added benefit, tree growth improved greatly. These increases have remained relatively constant over the 8 years since experimental thinning and show no evidence of decline.

Almost one-third of the Black Hills National Forest — some 1.2 million acres — is overstocked and could be thinned to increase water yield. This potential increase could exceed 50,000 acre feet per year, enough to meet the needs of a city of 70,000 people.



This thinned ponderosa pine stand will yield nearly one-third more water.

MANAGING AND PRESERVING TROPICAL FORESTS

Tropical forests constitute about one-half of the world's forests but they are rapidly being depleted. Because these ecosystems are critical to the existence of millions of people and perhaps to the entire world, their management and preservation is of utmost importance to scientists and resource managers.

Scientists at the Southern Forest Experiment Station, in cooperation with the University of Florida, Cornell University, and the Tropical Science Center in Costa Rica, summarized available data concerning the role of tropical forests in the world carbon cycle. This included a synthesis of available information on the production and storage of organic matter in the tropics. Data were analyzed according to life zones, thus making the synthesis useful for extrapolation to all the world's tropics. This synthesis will provide a sound basis for predicting the role of the tropics in the world's carbon cycle and will assist tropical countries in their struggle to manage their vital resources.



Tropical forests play a vital role in the world's carbon cycle.

HOW TO MANAGE THE PONDEROSA PINE

A recently published General Technical Report, PNW-97, *Silviculture of Ponderosa Pine in the Pacific Northwest: The State of Our Knowledge*, will help foresters manage 6.7 million acres of forest land in the ponderosa pine type in the Pacific Northwest.

The publication summarizes 40 years of studies — from stand regeneration to harvest. A policy of gradual removal of mature trees to maintain existing reproduction is emphasized. The report includes estimated yields of the next crop of trees and discusses pests likely to be encountered in managing the new stands. It contains over 100 references that deal with managing ponderosa pine.



There are 6.7 million acres of ponderosa pine forests in the Pacific Northwest.

The capacity to forecast growth and yield of a timber stand is a prerequisite of effective planning and management of the forest resource. Yield tables and models developed by Forest Service researchers are used by forest managers to formulate silvicultural prescriptions and simulate the complex process of growth over time. The managers can also analyze the financial aspects of various management alternatives.

Growth models developed by the North Central Forest Experiment Station are now available for both mature, uneven-aged and second-growth, even-aged stands of sugar maple. Using these models, based on data from long-term growth studies, forest managers in the Lake States can update inventories and compare management strategies. They can also predict yields for managed stands of this valuable hardwood species.





Using Forest Survey data, Southern Forest Experiment Station mensurationists have devised a system of equations to estimate current yield and to project basal area and volumes for merchantable natural stands of loblolly pine in the West Gulf area. Equations have also been developed to predict stand volumes for managed, natural longleaf pine for a variety of stand conditions, thinning regimes, and rotation lengths.

At the Rocky Mountain Forest and Range Experiment Station, scientists have developed a computer program RMYLD, **R**ocky **M**ountain **Y**ield, to compute yield tables for even-aged and two-storied stands of Black Hills and southwestern ponderosa pine, Engelmann spruce-subalpine fir, and even-aged stands of lodgepole pine in the Rockies. RMYLD can also compute yield tables where timber production is emphasized and where forests are managed to improve wildlife habitat, recreation, scenic, and water values. The program considers changes in stand conditions, severity of dwarf mistletoe infestation, and response to partial cuttings. The land manager can now compute yield tables for the rotation of a stand for each management alternative before financial investment.



Researchers have developed equations to predict stand volumes for managed, natural longleaf pine.

SUBJECT MATTER GUIDE FOR RESEARCH PUBLICATIONS

	Page		Page
Environment	49	Resource Economics	
Watershed Management.....	49	 Forest Resource Evaluation.....	106
Wildlife	54	Forest Economics	111
Range	62	Supply, Demand, and Price Analysis	113
 Fisheries Habitat	64	Timber Management	
Forest Recreation	65	Biological Relations.....	115
Urban Forestry.....	69	Silviculture	121
Disturbed Areas Rehabilitation.....	73	Management and Mensuration	127
Fire and Atmospheric Sciences		Genetics and Tree Improvement.....	131
Fire Prevention, Hazard Reduction, and Prescribed Burning	75	Special Products.....	133
Fire Management Methods and Systems.....	76		
 Forest Fire Science	77		
Ecological Relations	78		
Weather Modification and Weather Effects.....	80		
Insects and Disease			
Insect Detection and Evaluation.....	81		
Insect Biology	84		
Insect Control and Management Strategies	87		
 Disease Detection and Evaluation	92		
Disease Biology	92		
Disease Control and Management Strategies.....	94		
Air Pollution	96		
Wood Products Organisms	96		
Products and Engineering			
Improving Forest Engineering Systems	97		
Wood Engineering	98		
Wood Chemistry and Fiber Products.....	99		
Utilization Potential and Processing of Wood.....	101		

ENVIRONMENT

Watershed Management

Avery, Charles C., and Malchus B. Baker, Jr.

1980. Evaluating hydrologic responses to forest activities. *In* Symposium on Watershed Management 1980. C.W. Johnson, ed. American Society of Civil Engineers, New York. p. 485-493.

Beasley, R. Scott.

1979. Assessment of non-point source pollution from forest practices in the south central region. *In* Current research, research needs and problems in assessing impact of forest management practices on water quality and utility. National Council of the Paper Industry for Air and Stream Improvement Technical Bulletin 328:10-13.

Bedunah, D., and M.J. Trlica.

1979. Sodium chloride effects on carbon dioxide exchange rates and other plant and soil variables of ponderosa pine. Canadian Journal of Forest Research 9(3):349-353. [Eisenhower Consortium Journal Series Paper 22].

Belt, George H.

1980. Predicting streamflow changes caused by forest practices using the equivalent clearcut area model. University of Idaho, Moscow, College of Forestry, Wildlife and Range Sciences, Bulletin 32. 11 p.

Bergen, J.D.

1979. Aerial spray patterns in a forest canopy. Transactions American Society of Aeronautical Engineers 22:1279-1287.

Bird, Kenneth G.

1980. Design and construction of a miniature solar power system to operate meteorological instruments. U.S. Dep. Agric. For. Serv. Research Note RM-390. 4 p.

Bollen, Walter B., and Logan A. Norris.

1979. Influence of 2, 3, 7, 8-tetrachlorodibenzo-*p*-dioxin on respiration in a forest floor and soil. Bulletin of Environmental Contamination and Toxicology 22:648-652.

Clayton, James L., and Debora A. Kennedy.

1980. A comparison of the nutrient content of Rocky Mountain Douglas-fir and ponderosa pine trees. U.S. Dep. Agric. For. Serv. Research Note INT-281. 13 p.

Clayton, James L., Walter F. Megahan, and Delon Hampton.

1979. Soil and bedrock properties: weathering and alteration products and processes in the Idaho batholith. U.S. Dep. Agric. For. Serv. Research Paper INT-237. 35 p.

Cline, Richard, Gene Cole, Walt Megahan, and others.

1980. Guidelines for predicting sediment yields. U.S. Dep. Agric. For. Serv. Northern Region and Intermountain Region.

Colbeck, S.C., E.A. Anderson, V.C. Bissell, and others.

1979. Snow accumulation, distribution, melt, and runoff. Transactions American Geophysical Union 60:465-468.

Cole, Gene F., and Walter F. Megahan.

1980. South Fork Salmon River — future management. *In* Symposium on Watershed Management 1980. American Society of Civil Engineers, New York. p. 396-405.

Cook, M.J., and W.H. Valentine.

1979. Monitoring cut slope erosion by close-range photogrammetry. U.S. Dep. Agric. For. Serv. Field Notes II(7):5-9.

Cooley, John H.

1979. Fertilization of *Populus* with municipal and industrial waste. *In* Annual Meeting 1979, North American Poplar Council. p. 101-108.

Corbett, Edward S.

1980. Report: Session I, workshop C, Employing the urban forest for water quality and quality control. *In* Proceedings National Urban Forestry Conference, Volume I. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 431-432.

Corbett, Edward S.

1980. Water resources in the urban forest environment. *In* Proceedings National Urban Forestry Conference, Volume I. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 361-367.

Cress, William, Glyn O. Throneberry, and Donald L. Lindsey.

1979. Kinetics of phosphorus absorption by mycorrhizal and nonmycorrhizal tomato roots. Plant Physiology 64:484-487.

Cromack, K., Jr., F.J. Swanson, and C.C. Grier.

1978. A comparison of harvesting methods and their impact on soils and environment in the Pacific Northwest. *In* Forest Soils and Land Use. Proceedings of the 5th North American Forest Soils Conference [Colorado State University, Fort Collins, August 1978]. Chester T. Youngberg, ed. p. 449-476.

Davis, Edwin A.

1980. Effects of converting chaparral to grass on the chemical composition of stream water. *In* Western Society of Weed Sciences: 1980 Research Progress Report [Salt Lake City, Utah, March 18-20, 1980]. p. 75-77.

Environment

- Davis, E.A., N. Rieger, and D.A. Bryant.
1980. Tests of soil-applied chemicals for chaparral management in Arizona. *In* Western Society of Weed Sciences: 1980 Research Progress Report [Salt Lake City, Utah, March 18-20, 1980]. p. 77-79.
- Dendy, F.E., S.J. Ursic, and A.J. Bowie.
1979. Sediment sources and yields from upland watersheds in north Mississippi. *In* Proceedings, Mississippi Water Resources Conference 1979. p. 49-54.
- Dickerson, B.P., and D.C. McClurkin.
1980. A field trial of year-round planting of "bullet" seedlings. *Tree Planters' Notes* 31(2):21-22.
- Douglass, James E.
1980. Silviculture for water yield. *Proceedings Society of American Foresters* 1979. p. 90-96.
- Douglass, James E., and Daniel G. Neary.
1980. Coweeta Hydrologic Laboratory, 1934-2034: past, present and future. *In* The Influence of Man on the Hydrologic Regime With Special Reference to Representative and Experimental Basins. *Proceedings Helsinki Symposium for Hydrology Science Publication 130* [Helsinki, June 1980]. p. 61-65.
- Farmer, Eugene E.
1980. Phosphate mine dump hydrology. *In* Symposium on Watershed Management 1980. C.W. Johnson, ed. American Society of Civil Engineers, New York. p. 846-854.
- Federer, C. Anthony.
1980. Frequency of agricultural and forest drought in New Hampshire: 1926-1975. University of New Hampshire Water Resources Research Center Research Report 26. 37 p.
- Federer, C. Anthony.
1980. Paper birch and white oak saplings differ in responses to drought. *Forest Science* 26:313-324.
- Fowler, W.B., J.D. Helvey, and C. Johnson.
1979. Baseline climatic and hydrologic relationships for the High Ridge evaluation area. U.S. Dep. Agric. For. Serv. General Technical Report PNW-91. 17 p.
- Fowler, W.B., and A.R. Tiedemann.
1980. Phenological relationships of *Spiraea betulifolia* Pall. and *Apocynum androsaemifolium* L. *Northwest Science* 54(1):17-25.
- Fredriksen, Richard L., and R. Dennis Harr.
Freeburg, R.S., G.E. Carruthers, and J.B. Duncan.
1980. Water quality in recreational land use. *Proceedings American Society of Agricultural Engineers* [Summer meeting, June 15-18, 1980, San Antonio, Tex.]. [Eisenhower Consortium Journal Paper 48]. p. 1-16.
- Frøehlich, Henry A.
1979. Soil compaction from logging equipment: effects on growth of young ponderosa pine. *Journal of Soil and Water Conservation* 34(6):276-278.
- Garcia, George.
1979. A portable irrigation system for remote sites. U.S. Dep. Agric. For. Serv. Research Note RM-374. 2 p.
- Gottfried, Gerald J., and Peter F. Ffolliott.
1980. An evaluation of snowmelt lysimeters in an Arizona mixed conifer stand. *In* Hydrology and Water Resources in Arizona and the Southwest. *Proceedings 1980 Meeting of the Arizona Section, American Water Resources Association and Hydrology Section, Arizona-Nevada Academy of Science* [Las Vegas, Nev., April 1980]. Volume 10. p. 221-229.
- Gresswell, Stuart, David Heller, and Douglas N. Swanston.
1979. Mass movement response to forest management in the central Oregon Coast Ranges. U.S. Dep. Agric. For. Serv. Resource Bulletin PNW-84. 26 p.
- Harr, R. Dennis.
1979. Effects of timber harvest on streamflow in the rain-dominated portion of the Pacific Northwest. *In* Proceedings of Workshop on Scheduling Timber Harvest for Hydrologic Concerns. U.S. Dep. Agric. For. Serv., Pacific Northwest Region, Portland, Oreg.
- Harr, R. Dennis.
1980. Streamflow after patch logging in small drainages within the Bull Run Municipal Watershed, Oregon. U.S. Dep. Agric. For. Serv. Research Paper PNW-268. 16 p.
- Hawk, Glenn M.
1979. Vegetation mapping and community description of a small western Cascade watershed. *Northwest Science* 53(3):200-212.
- Hedtko, James L., and Logan A. Norris.
1980. Effect of ammonium chloride on predatory consumption rates of brook trout (*Salvelinus fontinalis*) on juvenile chinook salmon (*Oncorhynchus tshawytscha*) in laboratory streams. *Bulletin of Environmental Contamination and Toxicology* 24:81-89.
- Heede, Burchard H.
1978. Designing gully control systems for eroding watersheds. *Environmental Management* 2(6):509-522.

- Heede, B.H.
1980. Gully erosion — a soil failure: possibilities and limits of control. *Interpraevent* 1980. Volume 1, p. 317-330.
- Helvey, J.D., and W.B. Fowler.
1979. Grass seeding and soil erosion in a steep, logged area in northeastern Oregon. U.S. Dep. Agric. For. Serv. Research Note PNW-343. 11 p.
- Henderson, G.S., J.W. Hornbeck, and W.T. Swank.
1980. Impact of atmosphere sulfur deposition on the quality of water from forested watersheds. *In* Atmospheric sulfur deposition: environmental impacts and health effects. D.S. Shriner, C.R. Richman, S.E. Linberg, eds. Ann Arbor Science, Inc. p. 431-442.
- Hibbert, Alden R.
1979. Vegetation management for water yield improvement in the Colorado River Basin. U.S. Dep. Agric. For. Serv. and Pacific Southwest Interagency Commission Miscellaneous Publication. 58 p.
- Hibbert, Alden R.
1979. Managing vegetation to increase flow in the Colorado River Basin. U.S. Dep. Agric. For. Serv. General Technical Report RM-66. 27 p.
- Holcomb, George J., and Philip B. Durgin.
1979. Ash leachate can reduce surface erosion. U.S. Dep. Agric. For. Serv. Research Note PSW-342. 4 p.
- Hook, Thomas E., and Alden R. Hibbert.
1979. Sediment production from a chaparral watershed in central Arizona. *In* Hydrology and Water Resources In Arizona and the Southwest. Proceedings 1979 Meeting of the Arizona Section, American Water Resources Association, and Hydrology Section, Arizona-Nevada Academy of Science [Tempe, Ariz., April 13]. Volume 9, p. 31-36.
- Johnson, Curtis M.
1980. Computer techniques for land management planning. U.S. Dep. Agric. For. Serv. Research Note RM-387. 4 p.
- Johnson, D.W., J.W. Hornbeck, J.M. Kelly, and others.
1980. Regional patterns of soil sulfate accumulation: relevance to ecosystem sulfur budgets. *In* Atmospheric sulfur deposition: environmental impacts and health effects. D.S. Shriner, C.R. Richman, and S.E. Linberg, eds. Ann Arbor Science, Inc. p. 507-520.
- Johnson, Michael G., and Robert L. Beschta.
1980. Logging, infiltration capacity, and surface erodibility in western Oregon. *Journal of Forestry* 78(6):334-337.
- Johnston, Robert S., and Ray W. Brown.
1979. Hydrologic aspects related to the management of alpine areas. *In* Special management needs of alpine ecosystems. p. 65-75.
- Kearney, P.C., H.R. Buser, W. Crummett, and others.
1979. Chemistry workshop. *In* Scientific dispute resolution conference on 2, 4, 5-T. American Farm Bureau Federation. p. 16-24.
- Keller, Edward A., and Frederick J. Swanson.
1979. Effects of large organic material on channel form and fluvial processes. *Earth Surface Proceedings* 4:361-380.
- Klock, G.O.
1979. Some engineering aspects of forest soils of the Douglas-fir region. *In* Forest soils of the Douglas-fir region, chapter 15. Washington State University Cooperative Extension, Pullman. p. 269-277.
- Klock, Glen O., and Boyd E. Wickman.
1978. Ecosystem effects. *In* The Douglas-fir tussock moth: a synthesis, chapter 4.8. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 90-95.
- Kochenderfer, J.N., and G.W. Wendel.
1980. Costs and environmental impacts of harvesting timber in Appalachia with a truck-mounted crane. U.S. Dep. Agric. For. Serv. Research Paper NE-456. 9 p.
- Koerper, G.J., and C.J. Richardson.
1980. Biomass and net annual primary production regressions for *Populus grandidentata* on three sites in northern lower Michigan. *Canadian Journal of Forest Research* 10(1):92-101.
- Lang, T.E., and R.L. Brown.
1980. Numerical simulation of snow avalanche impact on structures. U.S. Dep. Agric. For. Serv. Research Paper RM-216. 21 p.
- Lewis, Gordon D.
1980. The Eisenhower Consortium for Western Environmental Forestry Research: research highlights, 1972-1980. *Eisenhower Consortium Bulletin* 8, 31 p.
- Lewis, William M., Jr., and Michael C. Grant.
1979. Relationships between stream discharge and yield of dissolved substances from a Colorado mountain watershed. *Soil Science* 128(6):353-363. [Eisenhower Consortium Journal Series Paper 31].
- Lewis, William M., Jr., and Michael C. Grant.
1979. Relationships between snow cover and winter losses of dissolved substances from a mountain watershed. *Arctic and Alpine Research* 12(1): 11-17. [Eisenhower Consortium Journal Series Paper 39].
- Lopushinsky, W.
1980. Occurrence of root pressure exudation in Pacific Northwest conifer seedlings. *Forest Science* 26(2):275-279.

Environment

- Lopushinsky, W., and T. Beebe.
1976. Effect of black polyethylene mulch on survival of Douglas-fir seedlings, soil moisture content, and soil temperature. *Tree Planters' Notes* 27(3):7-8.
- Lopushinsky, W., and T. Beebe.
1976. The significance of shoot-root ratio for survival and growth of outplanted east-Cascade Douglas-fir and ponderosa pine seedlings. *Proceedings Western Forestry Nursery Council and Intermountain Nurserymen's Association*. p. 79-86.
- Lopushinsky, W., and G.O. Klock.
1980. Effect of defoliation on transpiration in grand fir. *Canadian Journal of Forest Research* 10(1):114-116.
- Lorz, Harold W., Susan W. Glenn, Ronald H. Williams, and others.
1979. Effects of selected herbicides on smolting of coho salmon. U.S. Environmental Protection Agency EPA-600/3-79-071. 103 p.
- Losche, C.K., and D.H. Urie.
1980. Greenhouse and field evaluations of municipal sewage sludge of reclamation of acid strip-mine spoils in southern Illinois. *In Proceedings Third Madison Conference on Municipal and Industrial Waste* [Madison, Wisc., September 9-11, 1980]. p. 75-87.
- Lynch, James A., and Edward S. Corbett.
1980. Acid precipitation — a threat to aquatic ecosystems. *Fisheries* 5(3):8-10, 12.
- Martin, C. Wayne, and Robert S. Pierce.
1980. Clearcutting patterns affect nitrate and calcium in streams in New Hampshire. *Journal of Forestry* 78:268-272.
- Martinelli, M., Jr. (committee chairman).
1979. Snow and ice, chapter 9. *In National handbook of recommended methods for water-data acquisition*. U.S. Department of the Interior, Geological Survey, Office of Water Data coordination. p. 9-1 to 9-34.
- Martinelli, M., Jr., R. A. Sommerfeld, Robert Thomas, and others.
1979. Research on snow and ice. A review. *Geophysics and Space Physics* 17(6):1253-1288.
- Megahan, Walter F.
1979. Effects of forest practices [sic.] on runoff and erosion. Text on Forest Hydrology . . . Italian. Università di Padova, Italy. 106 p.
- Megahan, Walter F.
1980. Channel stability and channel erosion processes. *In Proceedings of Workshop on Scheduling Timber Harvest for Hydrologic Concerns*. U.S.
- Megahan, Walter F., Norman F. Day, and Timothy M. Bliss.
1979. Landslide occurrence in the western and central Northern Rocky Mountain physiographic province in Idaho. *In Forest soils and land use*. Chester T. Youngberg, ed. Colorado State University, Fort Collins. p. 116-139.
- Miller, Richard A., Logan A. Norris, and Bobby R. Loper.
1979. The response of coho salmon and guppies to 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin (TCDD) in water. *Transactions American Fisheries Society* 108:401-407.
- Molles, Manuel C., Jr.
1980. Effects of road salting on aquatic invertebrate communities. *Eisenhower Consortium Bulletin* 10, 9 p.
- Molnau, M., and E. Chacho.
1980. Snow-erosion relationships on mine waste dumps. *In Symposium on Watershed Management 1980*. C.W. Johnson, ed. American Society of Civil Engineers, New York. p. 877-886.
- Moore, Duane G., and Logan A. Norris.
1979. Forest chemicals in watershed management. *In Forest soils of the Douglas-fir region*, chapter 14. Washington State University Cooperative Extension, Pullman. p. 261-268.
- Murphey, W.K., and D.A. Cowan.
1979. Bark as a filter for iron in acid mine effluents. *In Utilizing bark and wood residues to solve technical problems: Proceedings Forest Products Resources Society*, Madison, Wis. p. 46-55.
- Patric, James H.
1980. Effects of wood products harvest on forest soil and water relations. *Journal of Environmental Quality* 9(1):73-80.
- Patric, James H.
1980. Physical effects of timber harvesting on forest soil and water. *In Proceedings Logging Residue Conference* [West Virginia University, Morgantown, June 4, 5, 6, 1975]. p. 1-3.
- Patric, James H.
1980. Some environmental effects of cable logging. U.S. Dep. Agric. For. Serv. General Technical Report NE-55. 29 p.
- Patric, James H., and W.H. Lyford.
1980. Soil-water relations at the headwaters of a forest stream in central New England. *Harvard Forest Paper* 22. 24 p.
- Pedersen, B.B., J.D. Dent, and T.E. Lang.

- Pierce, R.S., and H.M. Keller.
1980. Forest land use impacts on upstream water sources. *In* Land Use Impacts on Lake and Reservoir Ecosystems [Proceedings Man and the Biosphere 5 Workshop, Warsaw, Poland]. N. Duncan and J. Rzoska, eds. Facultas-Verlag. p. 112-128.
- Ponce, Stanley L., and Howard L. Gary.
1979. The effect of lake-based recreation and second home use on surface water quality in the Manitou Experimental Forest. U.S. Dep. Agric. For. Serv. Research Paper RM-211. 10 p.
- Reich, Brian M., Herbert B. Osborn, and Malchus B. Baker, Jr.
1979. Tests on Arizona's new flood estimates. *In* Hydrology and Water Resources in Arizona and the Southwest, Proceedings Arizona Section, American Water Resources Association and the Hydrology Section, Arizona Academy of Science. p. 65-74.
- Rice, Raymond M., Forest B. Tilley, and Patricia A. Datzman.
1979. A watershed's response to logging and roads: South Fork of Caspar Creek, 1967-76, U.S. Dep. Agric. For. Serv. Research Paper PSW-146. 12 p.
- Riekerk, H., S.A. Jones, L.A. Morris, and D.A. Pratt.
1979. Hydrology and water quality of three small Lower Coastal Plains forested watersheds. Proceedings Soil Crop Science Society of Florida 38 [September 1978]. p. 105-111.
- Riekerk, H., L.A. Morris, and C.J. Lassiter.
1979. The effect of harvesting of flatwoods forests on water quality and nutrient budgets. *In* Stream improvement. R.O. Blosser, ed. National Council of Paper Industries for Air and Stream Improvement, Inc., New York, Technical Bulletin 328. p. 109.
- Riekerk, H., B.F. Swindel, and J.A. Replogle.
1980. Effect of forestry practices in Florida watersheds. *In* Watershed management 1980. C.W. Johnson, ed. American Society of Civil Engineers, New York. p. 706-721.
- Riekerk, Hans, Bennie F. Swindel, and John A. Replogle.
1980. Initial hydrologic effects of forestry practices in Florida flatwoods watersheds. Intensive Management Practices Assessment Center Report 5(4). 24 p. University of Florida, Gainesville.
- Schreiber, J.D., P.D. Duffy, and D.C. McClurkin.
1980. Aqueous- and sediment-phase nitrogen yields from five southern pine watersheds. Soil Science Society of America Journal 44(2):401-407.
- Schroeder, Max H., and David L. Sturges.
1980. Spraying of big sagebrush with 2, 4-D causes negligible stream contamination. Journal of Range Management 33(4):311-312.
- Slaughter, Charles W., and Douglas L. Kane.
1979. Hydrologic role of shallow organic soils in cold climates. *In* Canadian Hydrology Symposium: 79 — cold climate hydrology, NRCC-17834, National Research Council of Canada, Ottawa. p. 380-389.
- Smith, James L., and Neil Berg, compilers.
1979. The Sierra ecology project, volume 4. Bibliography of the environmental effects of weather modification. U.S. Department of the Interior, Bureau of Reclamation, Office of Atmospheric Resources Management, Denver, Colo. 157 p.
- Snyder, Gordon.
1980. Monitoring on wilderness water quality. Symposium on Watershed Management 1980. C.W. Johnson, ed. American Society of Civil Engineers, New York. p. 504-516.
- Sopper, William E.
1979. Surface application of sewage effluent and sludge. The Pennsylvania State University Press, University Park, Institute for Research on Land and Water Resources. Reprint Series 86. p. 633-663.
- Sopper, William E., and Sonja N. Kerr.
1980. Increased woody biomass production and land treatment of wastewater, an economic symbiotic relationship. *In* Technology for Energy Conservation. Proceedings Information Transfer, Inc., Silver Spring, MD. p. 118-125.
- Sopper, William E., and Sonja N. Kerr.
1980. Maximizing forest biomass energy production by municipal wastewater irrigation. *In* Energy from biomass wastes. Institute of Gas Technology, Chicago, Ill.
- Stark, Nellie.
1980. Changes in soil water quality resulting from three cutting methods and three levels of fiber utilization. Journal of Soil and Water Conservation 35(4): 183-187.
- Stone, E.L., W.T. Swank, and J.W. Hornbeck.
1980. Impacts of timber harvest and regeneration systems on stream flow and soils in the eastern deciduous region. *In* Forest Soils and Land Use. Proceedings Fifth North American Forest Soils Conference. Chester T. Youngberg, ed. Colorado State University, Fort Collins. p. 516-535.
- Sturges, David L.
1980. Soil water withdrawal and root distribution under grubbed, sprayed, and undisturbed big sagebrush vegetation. Great Basin Naturalist 40(2):157-164.
- Swanson, Fred.
1979. Comments on geomorphology in ecosystem studies. *In* Guidebook for a field trip to observe natural and management-related erosion in Franciscan terrane of northern California. Cordilleran Section, Geological Society of America, p. VII-1 to VII-8.

Swanson, Fred.

1979. Workshop notes: timber harvest scheduling and sediment routing. *In* Proceedings of Workshop on Scheduling Timber Harvest for Hydrologic Concerns. U.S. Dep. Agric. For. Serv., Pacific Northwest Region, Portland, Oreg.

Swanson, F.J., R.D. Harr, and R.L. Fredriksen.

1980. Geomorphology and hydrology in the H.J. Andrews experimental forest, western Cascades. *In* Geologic field trips in western Oregon and southwestern Washington. Oregon State Department of Geology and Mineral Industry, Portland, Oreg. Bulletin 101. p. 217-232.

Swanson, Douglas N.

1978. Effect of geology on soil mass movement activity in the Pacific Northwest. *In* Forest Soils and Land Use. Proceedings 5th North American Forest Soils Conference. Chester T. Youngberg, ed. Colorado State University, Fort Collins. p. 89-115.

Tiedemann, Arthur R., Carol E. Conrad, John H. Dieterich, and others.

1979. Effects of fire on water: a state-of-knowledge review. U.S. Dep. Agric. For. Serv. General Technical Report WO-10. 28 p.

Tiedemann, A.R., J.D. Helvey, and T.D. Anderson.

1980. Effects of chemical defoliation of an *Abies grandis* habitat on amounts and chemistry of throughfall and stemflow. *Journal of Environmental Quality* 9(2):320-328.

Trotta, Paul D., James J. Rogers, and William B. Vandivere.

1979. Impact of development on stream flows. *In* Hydrology and Water Resources in Arizona and the Southwest, Proceedings Arizona Section, American Water Resources Association and the Hydrology Section, Arizona Academy of Science. p. 109-118.

Ursic, S.J.

1979. Forestry practices and the water resource of the upper Coastal Plain. *In* Florida's Water Resources — Implications for Forest Management, 11th Spring Symposium, Florida State Society of American Foresters. University of Florida Resources Report 6:83-91.

Ursic, S.J.

1979. Sediment contributions from southern forest management practices. *In* Pollution control in the forest products industry. U.S. Environmental Protection Agency Seminar Publication, Technology Transfer EPA 625/3-79-010:53-55, 79, 81.

Ursic, S.J., and J.E. Douglass.

1979. The effects of forestry practices on water resources. *In* Proceedings: The W. Kelly Mosley Environmental Forum. Auburn University Press, Auburn, Ala. p. 33-49.

Verry, Elon S., and Don H. Boelter.

1978. Peatland hydrology. *In* Wetland Functions and Values: The State of our Understanding. Proceedings National Symposium on Wetlands. American Water Resources Association, Minneapolis, Minn. p. 389-402.

Wagner, Sheldon L., James M. Witt, Logan A. Norris, and others.

1979. A scientific critique of the EPA Alesia II study and report. Environmental Health Science Center, Oregon State University, Corvallis. 92 p.

Wildlife

Applegate, Roger D., Lynn L. Rogers, David A. Casteel, and James M. Novak.

1979. Germination of cow parsnip seeds from grizzly bear feces. *Journal of Mammalogy* 60(3):655.

Ault, Stacey C., and Fred A. Stormer.

1979. Food habits and preferences of scaled quail. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 58.

Baldassarre, Guy A., and Eric G. Bolen.

1979. Availability and nutritional aspects of winter foods of the mallard. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 65.

Barnes, D.M., and L.L. Rogers.

1980. Clostridial myonecrosis in a black bear associated with drug administration. *Journal of Wildlife Diseases* 16(3):315-317.

Beasom, Samuel L., and Oliver H. Pattee.

1980. The effect of selected climatic variables on wild turkey productivity. *In* Proceedings 4th National Wild Turkey Symposium [Little Rock, Ark.]. p. 127-135.

Blair, Robert M., and Louis E. Brunnett.

1980. Seasonal browse selection by deer in a southern pine-hardwood habitat. *Journal of Wildlife Management* 44:79-88.

Blair, Robert M., Henry L. Short, Leonard F. Burkart, and others.

1980. Seasonality of nutrient quality and digestibility of three southern deer browse species. U.S. Dep. Agric. For. Serv. Research Paper SO-161. 13 p.

Brown, David E., Charles H. Lowe, and Charles P. Pase.

1980. A digitized systematic classification for ecosystems with an illustrated summary of the natural vegetation of North America. U.S. Dep. Agric. For. Serv. General Technical Report RM-73. 93 p.

- Buech, Richard R.
1980. Christmas tree plantations — for the birds? *American Christmas Tree Journal* 24(1):22-24.
- Buech, Richard R.
1980. Vegetation of a Kirtland's warbler breeding area and 10 nest sites. *The Jack-Pine Warbler* 58(2):59-72.
- Bull, Evelyn L., and Richard J. Pedersen.
1978. Two methods of trapping adult pileated woodpeckers at their nest cavities. *North American Bird Bander* 3(3):95-99.
- Conner, Richard N.
1979. Minimum standards and forest wildlife management. *Wildlife Society Bulletin* 7:293-296.
- Conner, Richard N.
1980. Foraging habitats of woodpeckers in southwestern Virginia. *Journal of Field Ornithology* 51:119-127.
- Conner, Richard N., and James G. Dickson.
1980. Strip transect sampling and analysis for avian habitat studies. *Wildlife Society Bulletin* 8:4-10.
- Conner, Richard N., and Brian A. Locke.
1979. Effects of a prescribed burn on cavity trees of red-cockaded woodpeckers. *Wildlife Society Bulletin* 7:291-293.
- Crawford, H.S.
1980. Environmental impacts of uncontrolled budworm feeding. *Maine Forest Review*, volume 13.
- Cringan, Alexander T., Dale H. Arner, Robert J. Robel, and others.
1979. Status of current research in wildlife. *Transactions 44th North American Wildlife and Natural Resources Conference. Wildlife Management Institute, Washington, D.C.* p. 148-156.
- Crouch, Glenn L.
1980. Postseason hunting to reduce deer damage to Douglas-fir in western Oregon. *U.S. Dep. Agric. For. Serv. Research Note PNW-349*. 6 p.
- Crouch, Glenn L., and Larry R. Frank.
1979. Poisoning and trapping pocket gophers to protect conifers in northeastern Oregon. *U.S. Dep. Agric. For. Serv. Research Paper PNW-261*. 8 p.
- DeByle, Norbert V.
1979. Potential effects of stable versus fluctuating elk populations in the aspen ecosystem. *In* *North American elk: ecology, behavior and management*. Mark S. Boyce and Larry D. Hayden-Wing, eds. University of Wyoming, Laramie. p. 13-19.
- Dickinson, Tony G., and C. David Simpson.
1979. Dispersal and establishment of barbary sheep in southeast New Mexico. *In* *Research highlights — 1979: noxious brush and weed control; range and wildlife management*. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 52.
- Dickinson, Tony G., and C. David Simpson.
1979. Home range, movements, and habitat use of barbary sheep in southeastern New Mexico. *In* *Research highlights — 1979: noxious brush and weed control; range and wildlife management*. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 55.
- Dickson, James G., Charles A. Segelquist, and Mitchell J. Rogers.
1979. Establishment of Japanese honeysuckle in the Ozark Mountains. *Proceedings Annual Conference Southeastern Association of Fish and Wildlife Agencies (1978)* 32:242-245.
- Downing, R.L.
1980. Resource allocation for wildlife, forestry, and range. *Proceedings Southern Forest Range and Pasture Symposium [New Orleans, La., March 1980]*. p. 89-98.
- Downing, R.L.
1980. Survey of interior least tern (*Sterna albigula*) nesting populations. *American Birds* 34(2):209-216.
- Downing, R.L.
1980. Vital statistics of animal populations. *In* *Wildlife management techniques manual*, 4th ed. S.D. Schemnitz, ed. Wildlife Society, Washington, D.C. Chapter 15, p. 247-267.
- Earle, Richard D., and Kenneth R. Kramm.
1980. Techniques for age determination in the Canadian porcupine. *Journal of Wildlife Management* 44(2):413-419.
- Elick, Gerald E., John A. Sealander, and Ronald J. Beumer.
1979. Temperature preferences, body temperature tolerances, and habitat selection of small colubrid snakes. *Transactions Missouri Academy of Science* 13:21-31.
- Evans, Keith E., and Richard N. Conner.
1979. Snag management. *In* *Management of north central and northeastern forests for nongame birds*. U.S. Dep. Agric. For. Serv. General Technical Report NC-51. p. 214-225.
- Evans, Keith E., Charles W. Putnam, and Shanna L. Nesby.
1979. Fire pink and wild pink hybrid. *Missouriensis* 1(3):6.
- Gary, Howard L., and Meredith J. Morris.
1980. Constructing wooden boxes for cavity-nesting birds. *U.S. Dep. Agric. For. Serv. Research Note RM-381*. 7 p.

- Gill, John D.
1980. Dual submission of manuscripts [editorial]. *Journal of Wildlife Management* 44:771.
- Gill, John D.
1980. Editorial news. *Journal of Wildlife Management* 44:299.
- Gill, John D.
1980. Tree farming — for the birds? *West Virginia Tree Farm News* 1980(4):7.
- Gill, John D., and Georgette B. Healy.
1980. Guidelines for *Journal of Wildlife Management* manuscripts, 1980. The Wildlife Society, Washington, D.C. 16 p.
- Goodwin, John G., Jr., and C. Roger Hungerford.
1979. Rodent population densities and food habits in Arizona ponderosa pine forests. U.S. Dep. Agric. For. Serv. Research Paper RM-214. 12 p.
- Grigal, D.F., and N.R. Moody.
1980. Estimation of browse by size classes for snowshoe hare. *Journal of Wildlife Management* 44(1):34-40.
- Grigal, D.F., and L.F. Ohmann.
1980. Seasonal change in nutrient concentrations in forest herbs. *Bulletin of the Torrey Botanical Club* 107(1):47-50.
- Grubb, Teryl G.
1980. An artificial bald eagle nest structure. U.S. Dep. Agric. For. Serv. Research Note RM-383. 4 p.
- Guthery, Fred S.
1979. Problems and potentials of Panhandle pheasants. *Texas Hunter's Hotline* 1979(7):42-43.
- Guthery, Fred S., Jay Custer, and Mike Owen.
1980. Texas Panhandle pheasants: their history, habitat needs, habitat development opportunities, and future. U.S. Dep. Agric. For. Serv. General Technical Report RM-74. 11 p.
- Guyette, Richard, E.A. McGinnes, Jr., G.E. Probasco, and K.E. Evans.
1980. A climate history of Boone County, Missouri, from tree-ring analysis of eastern redcedar. *Wood and Fiber* 12(1):17-28.
- Hall, Frederick C., and Jack Ward Thomas.
1979. Silvicultural options, chapter 9. In *Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington*. U.S. Dep. Agric., Agricultural Handbook 553. p. 128-147.
- Hamel, Paul B., and Robert G. Hooper.
1979. Bachman's warbler: the most critically endangered. *Proceedings First South Carolina Endangered Species Symposium* [Charleston, S.C., November 1976]. Dennis M. Forsythe and William B. Ezell, Jr., eds. p. 164-168.
- Hamel, Paul B., and Robert G. Hooper.
1979. Status of Bachman's warbler, a progress report. *Proceedings Rare and Endangered Wildlife Symposium* [Athens, Ga., August 1978]. Ron R. Odom and Larry Lander, eds. Georgia Department of Natural Resources, Game and Fish Division Technical Bulletin WL-4. p. 112-121.
- Harlow, Richard F., Ben A. Sanders, James B. Whelan, and L. Carlton Chappel.
1980. Deer habitat on the Ocala National Forest: improvement through forest management. *Southern Journal of Applied Forestry* 4(2):98-102.
- Harris, L.D., D.H. Hirth, and W.R. Marion.
1979. The development of silvicultural systems for wildlife. University of Florida, Gainesville. Intensive Management Practices Assessment Center Report 4(5). 24 p.
- Healy, William M., Richard O. Kimmel, David A. Holdermann, and William Hunyadi.
1980. Attracting ruffed grouse broods with tape-recorded chick calls. *Wildlife Society Bulletin* 8(1):69-71.
- Healy, William M., and Edward S. Nenko.
1980. Growth parameters and sex and age criteria for juvenile eastern wild turkeys. *National Wild Turkey Symposium* 4:168-185.
- Hirsch, Allan, William Krohn, Dennis Schweitzer, and Carl Thomas.
1979. Trends and needs in federal inventories of wildlife habitat. *Transactions North American Wildlife and Natural Resources Conference* 44:340-359.
- Hobbs, N. Thompson, and Don L. Baker.
1979. Rearing and training elk calves for use in food habits studies. *Journal of Wildlife Management* 43(2):568-570.
- Hobbs, N.T., D.L. Baker, J.E. Ellis, and D.M. Swift.
1979. Composition and quality of elk diets during winter and summer. A preliminary analysis. In *North American elk: ecology, behavior and management*. Mark S. Boyce and Larry D. Hayden-Wing, eds. University of Wyoming, Laramie. p. 47-53.
- Hoekstra, Thomas, Dennis Schweitzer, Charles Cushwa, and others.
1979. Preliminary evaluation of a national wildlife and fish data base. *Transactions North American Wildlife and Natural Resources Conference* 44:380-391.
- Hooper, Robert G., and Paul B. Hamel.
1979. Swainson's warbler in South Carolina. *Proceedings First South Carolina Endangered Species Symposium* [Charleston, S.C., November 1976]. Dennis M. Forsythe and William B. Ezell, Jr., eds. p. 178-182.
- Hooper, Robert G., Andrew F. Robinson, Jr., and Jerome A. Jackson.
1980. The red-cockaded woodpecker: notes on life history and management. U.S. Dep. Agric. For. Serv. General Report SA-GR 9. 8 p.

- opkins, Curtis R., and Jim C. Huntley.
1979. Establishment of sawtooth oak as a mast source for wildlife. *Wildlife Society Bulletin* 7(4):253-258.
- oeeln, Gregory T.
1980. A computer technique for analyzing radiotelemetry data. *In* Proceedings 4th National Wild Turkey Symposium. Arkansas chapter, The Wildlife Society. p. 262-271.
- oerth, Ben Jr., and Fred C. Bryant.
1979. Habitat use and productivity of mule deer in the Texas Panhandle. *In* Research highlights — 1979; noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 47-48.
- roll, James C., Richard N. Conner, and Robert R. Fleet.
1980. Woodpeckers and the southern pine beetle. U.S. Dep. Agric. Forest Pest Research and Development Program Agricultural Handbook 564. 23 p.
- asher, Douglas N., and Edward P. Hill.
1979. An evaluation of polypropylene mesh tubing as a deer browse deterrent for southern hardwood seedlings. Proceedings Annual Conference, Southeastern Association of Fish and Wildlife Agencies 31:239-245.
- eckenby, Donavin A.
1979. Rocky Mountain elk — the other 50 weeks. *Oregon Wildlife* 34(11):6-7.
- eckenby, Donavin A.
1980. Elk cover and forage inventory via satellite and computer. *Oregon Lands* 3(1):2-3.
- ennartz, Michael R.
1979. Multiple-use management: for some, a promise unfulfilled. *In* Multiple-use Management of Forest Resources, Proceedings Symposium [Clemson, S.C., September 1979]. Donal D. Hook and B. Allen Dunn, eds. Clemson University. p. 97-106.
- ennartz, Michael R., Robert G. Hooper, and Richard F. Harlow.
1979. The red-cockaded woodpecker: management research needs. Proceedings First South Carolina Endangered Species Symposium [Charleston, S.C., November 1976]. Dennis M. Forsythe and William B. Ezell, Jr., eds. p. 151-158.
- ennartz, Michael R., and Joe P. McClure.
1979. Estimating the extent of red-cockaded woodpecker habitat in the southeast. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 48-62.
- ocke, Brian A., Richard N. Conner, and James C. Kroll.
1979. Red-cockaded woodpecker stuck in cavity entrance resin. *Bird-Banding* 50:368-369.
- Lyon, L. Jack.
1979. Habitat effectiveness for elk as influenced by roads and cover. *Journal of Forestry* 77(10):658-660.
- Lyon, L. Jack, and Joseph V. Basile.
1980. Influences of timber harvesting and residue management on big game. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings. [September 11-13, 1979, Missoula, Mont.] U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 441-454.
- Lyon, L. Jack, and Chester E. Jensen.
1980. Management implications of elk and deer use of clearcuts in Montana. *Journal of Wildlife Management* 44(2):352-362.
- Maser, Chris, Ralph G. Anderson, Kermit Cromack, Jr., and others.
1979. Dead and down woody material, chapter 6. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 78-95.
- Maser, Chris, J. Michael Geist, Diane M. Concannon, and others.
1979. Wildlife habitats in managed rangelands — the Great Basin of southeastern Oregon: geomorphic and edaphic habitats. U.S. Dep. Agric. For. Serv. General Technical Report PNW-99. 84 p.
- Maser, Chris, Jon E. Rodiek, and Jack Ward Thomas.
1979. Cliffs, talus, and caves, chapter 7. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 96-103.
- Maser, Chris, Jack Ward Thomas, Ira David Luman, and Ralph Anderson.
1979. Wildlife habitats in managed rangelands — the Great Basin of southeastern Oregon: manmade habitats. U.S. Dep. Agric. For. Serv. General Technical Report PNW-86. 40 p.
- McArthur, E. Durant, A. Perry Plummer, and James N. Davis.
1978. Rehabilitation of game range in the Salt Desert. *In* Wyoming Shrublands, Proceedings of the Seventh Wyoming Shrub Ecology Workshop, May 31-June 1, 1978. Range Management Division, University of Wyoming, Laramie. p. 23-50.
- McClelland, B. Riley.
1979. Cavity nesters: part of Montana's bird heritage. *Montana Outdoors* 10(4): 34-37.
- McClelland, B. Riley.
1980. Influences of harvesting and residue management on cavity-nesting birds. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.] U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 469-496.

- McClelland, B. Riley, Sidney S. Frissell, William C. Fischer, and Curtis H. Halvorson.
1979. Habitat management for hole-nesting birds in forests of western larch and Douglas-fir. *Journal of Forestry* 77(8):480-483.
- McCluskey, D.C.
1979. Mountain bluebirds in northeast Oregon — natural nesting sites investigated. *Sialia* 1(2):57-58, 62.
- McNabb, F.M. Anne, Roger A. McNabb, Irvine D. Prather, and others.
1980. Nitrogen excretion by turkey vultures. *Condor* 82:219-223.
- Mech, L.D.
1979. Making the most of radio tracking — a summary of wolf studies in Northeastern Minnesota. *In* a handbook on biotelemetry and radio tracking. C.J. Amlaner, Jr., and D.W. MacDonald, eds. Pergamon Press Oxford and New York. p. 85-95.
- Medin, Dean E., and Robert B. Ferguson.
1980. High browse yield in a planted stand of bitterbrush. U.S. Dep. Agric. For. Serv. Research Note INT-279. 4 p.
- Moore, Richard L., and C. David Simpson.
1979. Annual waterfowl die-off pattern emerging. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 66.
- Moore, Richard L., and C. David Simpson.
1979. Corn, the mainstay of duck diets in fall and winter. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 65-66.
- Moore, William H.
1980. Survival and growth of oaks planted for wildlife in the flatwoods. U.S. Dep. Agric. For. Serv. Research Note SE-286. 4 p.
- Neff, Don J.
1980. Effects of watershed treatments on deer and elk range use. Arizona Game and Fish Department. Final Report. 37 p. Federal Aid in Wildlife Restoration Project W-78-R.
- Nelson, Michael E.
1979. Home range location of white-tailed deer. U.S. Dep. Agric. For. Serv. Research Paper NC-173. 10 p.
- Nenno, Edward S., and James S. Lindzey.
1979. Wild turkey poult feeding activity in old field, agricultural clearing, and forest communities. Transactions Northeast Fish and Wildlife Conference 36:97-109.
- Ohmann, Lewis F.
1979. Northeastern and north central forest types and their management. *In* Management of North Central and Northeastern Forests for Nongame Birds, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-51. p. 22-31.
- Ohmann, Lewis F., and David F. Grigal.
1979. Early revegetation and nutrient dynamics following the 1971 Little Sioux forest fire in northeastern Minnesota. Forest Science Monograph 21. 80 p.
- Owen, Michael S., and Fred S. Guthery.
1979. Habitat use of ring-necked pheasants in Castro County, Texas. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 64.
- Owen, Michael S., and Fred S. Guthery.
1979. Movements and ranges of ring-necked pheasants in Castro County, Texas. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 62.
- Patton, David R.
1979. How to use RUN WILD data files stored on microfiche. U.S. Dep. Agric. For. Serv. Research Note RM-377. 2 p.
- Patton, David R.
1979. RUN WILD II data files on microfiche. National Technical Information Service Document Number PB 296984. U.S. Department of Commerce, Springfield, Va. 28 fiche.
- Patton, David R.
1979. RUN WILD II: a storage and retrieval system for wildlife data. 44th North American Wildlife and Natural Resources Conference. Wildlife Management Institute, Washington, D.C. p. 425-429.
- Pedersen, Dick.
1979. Northeast Oregon elk research. *Oregon Wildlife* 34(11):3-5.
- Pedersen, Richard J., A.W. Adams, and Jon Skovlin.
1979. Elk management in Blue Mountain habitats. Oregon Department of Fish and Wildlife, Portland. 27 p.
- Pence, Danny B., Valerie E. Young, and Fred S. Guthery.
1979. Helminths of pheasants in the Texas Panhandle. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 64.
- Pence, Danny B., Valerie E. Young, and Fred S. Guthery.
1980. Helminths of the ring-necked pheasant, *Phasianus colchicus* (Gmelin) (Phasianidae), from the Texas Panhandle. Proceedings Helminthological Society of Washington 47(1):145-147.

- Powell, Roger A.
1979. Ecological energetics and foraging strategies of the fisher (*Martes pennanti*). *Journal of Animal Ecology* 48:195-212.
- Powell, Roger A.
1979. Fishers, population models, and trapping. *Wildlife Society Bulletin* 7(3): 149-154.
- Powell, Roger A.
1979. Mustelid spacing patterns: variations on a theme by *Mustela*. *Zeitschrift für Tierpsychologie* 50:153-165.
- Powell, Roger A.
1980. Fisher arborial activity. *Canadian Field-Naturalist* 94:90-91.
- Powell, Roger A.
1980. Stability in a one-predator-three-prey community. *American Naturalist* 115(4):567-579.
- Probst, John R.
1979. Oak forest bird communities. *In* Management of North Central and Northeastern Forests for Nongame Birds, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-51. p. 80-89.
- Putnam, Charles.
1979. The yellow-breasted chat in Missouri. *Bluebird* 46(3):25-27.
- Pyle, Robert L., and C. John Ralph.
1979. The summer season: Hawaiian Islands region. *American Birds* 33(6):898-899.
- Pyle, Robert L., and C. John Ralph.
1980. Hawaiian Islands region. *American Birds* 34(2):204-205.
- Pyle, Robert L., and C. John Ralph.
1980. The winter season: Hawaiian Islands region. *American Birds* 34(3):309-310.
- Rakstad, Donald, and John R. Probst.
1980. Aspen clearcut (6 years). *American Birds* 34(1):67.
- Rakstad, Donald, and John R. Probst.
1980. Aspen forest (19 years). *American Birds* 34(1):51.
- Rakstad, Donald, and John R. Probst.
1980. Mature aspen — northern hardwoods. *American Birds* 34(1):52.
- Rakstad, Donald, and John R. Probst.
1980. Red pine plantation. *American Birds* 34(1):67.
- Rakstad, Donald, and John R. Probst.
1980. Growth, reproduction, and survival in *Peromyscus leucopus* carrying
- Rogers, Lynn L.
1978. Interpretation of cementum annuli in first premolars of bears. *In* Proceedings Fourth Eastern Black Bear Workshop. Roy D. Hugie, ed. Maine Department of Inland Fisheries and Wildlife, Orono. p. 102-112.
- Rogers, Lynn L.
1980. Inheritance of coat color and changes in pelage coloration in black bears in northeastern Minnesota. *Journal of Mammalogy* 61(2):324-337.
- Rogers, Lynn L., L. David Mech, Deanna K. Dawson, and others.
1980. Deer distribution in relation to wolf pack territory edges. *Journal of Wildlife Management* 44(1):253-258.
- Rothstein, Stephen I., Jared Verner, and Ernest Stevens.
1980. Range expansion and diurnal changes in dispersion of the brown-headed cowbird in the Sierra Nevada. *Auk* 97:253-267.
- Sakai, Howard F., and C. John Ralph.
1980. An observation of 'Akiapola' au nest construction. *'Elepaio* 41(1):4-5.
- Sakai, Howard F., and C. John Ralph.
1980. Nest construction of the Hawaiian creeper near Volcano, Hawaii. *'Elepaio* 40(9):117-119.
- Sakai, Howard F., and C. John Ralph.
1980. Observations on the Hawaiian crow in South Kona, Hawaii. *'Elepaio* 40(10):133-138.
- Schwartz, Charles C., Julius G. Nagy, and Wayne L. Regelin.
1980. Juniper oil yield, terpenoid concentration and antimicrobial effects on deer. *Journal of Wildlife Management* 44(1):107-113.
- Schwartz, Charles C., Wayne L. Regelin, and Julius G. Nagy.
1980. Deer preference for juniper forage and volatile oil treated foods. *Journal of Wildlife Management* 44(1):114-120.
- Short, Henry L.
1979. Deer in Arizona and New Mexico: their ecology and a theory explaining recent population decreases. U.S. Dep. Agric. For. Serv. General Technical Report RM-70. 25 p.
- Skovlin, Jon, and Martin Vavra.
1979. Winter diets of elk and deer in the Blue Mountains, Oregon. U.S. Dep. Agric. For. Serv. Research Paper PNW-260. 21 p.
- Smith, H.R.
1980. Growth, reproduction, and survival in *Peromyscus leucopus* carrying

Environment

- Smith, H.R.
1980. Intraperitoneal transmitter implants in suckling white-footed mice, *Peromyscus leucopus*. Biotelemetry and Patient Monitoring, volume 7, Special Issue. S. Karger AG, Basel, Switzerland.
- Steuter, Allen A., and Henry A. Wright.
1980. White-tailed deer densities and brush cover on the Rio Grande Plains. *Journal of Range Management* 33(5):328-331.
- Stickney, Peter F.
1980. Data base for post-fire succession, first 6 to 9 years, in Montana larch-fire forests. U.S. Dep. Agric. For. Serv. General Technical Report INT-62. 133 p.
- Stormer, Fred A.
1979. Summer habitat of scaled quail in the Texas Panhandle. *In* Research highlights — 1979; noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 58.
- Stransky, John J., and Lowell K. Halls.
1979. Forage yield increased by clearcutting and site preparation. *Proceedings Annual Conference, Southeastern Association of Fish and Wildlife Agencies* (1978) 32:38-41.
- Stransky, John J., and Lowell K. Halls.
1979. Effect of a winter fire on fruit yield of woody plants. *Journal of Wildlife Management* 43:1007-1010.
- Stransky, John J., and Lowell K. Halls.
1980. Fruiting of woody plants affected by site preparation and prior land use. *Journal of Wildlife Management* 44:258-263.
- Strelke, William K., and James G. Dickson.
1980. Effect of forest clear-cut edge on breeding birds in east Texas. *Journal of Wildlife Management* 44:559-567.
- Swanson, G.A., technical coordinator.
1979. The Mitigation Symposium: A National Workshop on Mitigating Losses of Fish and Wildlife Habitats [July 16-20, 1979, Fort Collins, Colo.]. U.S. Dep. Agric. For. Serv. General Technical Report RM-65. 685 p.
- Szaro, Robert C., and Russell P. Balda.
1979. Bird community dynamics in a ponderosa pine forest. *Studies in Avian Biology*, Number 3. Cooper Ornithological Society. 66 p.
- Szaro, Robert C., and Russell P. Balda.
1979. Effects of harvesting ponderosa pine on nongame bird populations. U.S. Dep. Agric. For. Serv. Research Paper RM-212. 8 p.
- Taylor, Maple A., and Fred S. Guthery.
1980. Status, ecology, and management of the lesser prairie chicken. U.S. Dep. Agric. For. Serv. General Technical Report RM-77. 15 p.
- Taylor, Tim, and Fred S. Guthery.
1979. Causes of clutch loss in Texas Panhandle pheasants. *In* Research highlights — 1979; noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 63.
- Taylor, Tim, and Fred S. Guthery.
1979. Pheasant nesting in the Texas Panhandle. *In* Research highlights — 1979; noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 62-63.
- Thill, Ronald E., and Alton Martin.
1979. Deer and cattle diet overlap in Louisiana pine-hardwood forests. *In* Proceedings Annual Conference, Southeastern Association of Fish and Wildlife Agencies 33:64-71.
- Thomas, Jack Ward.
1979. Introduction, chapter 1. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 10-21.
- Thomas, Jack Ward, technical editor.
1979. Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. 512 p.
- Thomas, Jack Ward, Ralph G. Anderson, Chris Maser, and Evelyn L. Bull.
1979. Snags, chapter 5. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 60-77.
- Thomas, Jack Ward, Hugh Black, Jr., Richard J. Scherzinger, and Richard J. Pedersen.
1979. Deer and elk, chapter 8. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 104-127.
- Thomas, Jack Ward, Chris Maser, and Frederick C. Hall.
1980. Silviculture for improved wildlife habitat. *In* Town Meeting Forestry — Issues for the 1980s. Proceedings 1979 Convention, Society of American Foresters. p. 84-89.
- Thomas, Jack Ward, Chris Maser, and Jon E. Rodiek.
1979. Edges, chapter 4. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. agric., Agricultural Handbook 553. p. 48-59.
- Thomas, Jack Ward, Chris Maser, and Jon E. Rodiek.
1979. Riparian zones, chapter 3. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 40-47.

- Thomas, Jack Ward, Chris Maser, and Jon E. Rodiek.
1979. Wildlife habitats in managed rangelands — the Great Basin of southeastern Oregon: edges. U.S. Dep. Agric. For. Serv. General Technical Report PNW-85. 17 p.
- Thomas, Jack Ward, Rodney J. Miller, Chris Maser, and others.
1979. Plant communities and successional stages, chapter 2. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 22-39.
- Tilghman, Nancy G.
1980. The black tern survey, 1979. Passenger Pigeon 42:1-8.
- Turkowski, Frank J.
1980. Carnivora food habits and habitat use in ponderosa pine forests. U.S. Dep. Agric. For. Serv. Research Paper RM-215. 9 p.
- U.S. Dep. Agric. Forest Service.
1980. Workshop Proceedings: Management of Western Forests and Grasslands for Nongame Birds. U.S. Dep. Agric. For. Serv. General Technical Report INT-86. 535 p.
- Verner, J.
1980. Bird communities of mixed-conifer forests of the Sierra Nevada. *In* Workshop Proceedings: Management of Western Forests and Grasslands for Nongame Birds. U.S. Dep. Agric. For. Serv. General Technical Report INT-86. p. 198-223.
- Verner, Jared, Edward C. Beedy, Stephen L. Granholm, and others.
1980. Birds. *In* California wildlife and their habitats: western Sierra Nevada. U.S. Dep. Agric. For. Serv. General Technical Report PSW-37. p. 75-319.
- Verner, Jared, and Allen S. Boss, technical coordinators.
1980. California wildlife and their habitats: western Sierra Nevada. U.S. Dep. Agric. For. Serv. General Technical Report PSW-37. 439 p.
- Verner, Jared, and Allen S. Boss.
1980. Introduction and scope. *In* California wildlife and their habitats: western Sierra Nevada. U.S. Dep. Agric. For. Serv. General Technical Report PSW-37. p. 1-7.
- Verner, Jared, and Allen S. Boss.
1980. Using the publication. *In* California wildlife and their habitats: western Sierra Nevada. U.S. Dep. Agric. For. Serv. General Technical Report PSW-37. p. 9-11.
- Wallmo, Olof C.
1978. Mule and black-tailed deer, chapter 3. *In* Big game of North America. Ward, A. Lorin, and Jerry J. Cupal.
1979. Telemetered heart rate of three elk as affected by activity and human disturbance. *In* Proceedings Trails and Rivers Symposium [November 7-8, 1979, Laramie, Wyo.]. p. 93-102.
- Ward, A. Lorin, Nevin E. Fornwalt, Stephen E. Henry, and Robert A. Hodorff.
1980. Effects of highway operation practices and facilities on elk, mule deer, and pronghorn antelope. Federal Highway Administration, Office of Research and Development. Report FHWA RD-79-143. 48 p.
- Whitaker, John O., Jr., and Chris Maser.
1979. Parasitic mites of voles of the genera *Arborimus* and *Lagurus* in Oregon. Northwest Science 53(3):224-227.
- Whitaker, John O., Jr., Chris Maser, and Richard J. Pedersen.
1979. Food and ectoparasitic mites of Oregon moles. Northwest Science 53(4): 268-273.
- Whitaker, John O., Jr., Chris Maser, and William M. Wallace.
1979. Parasitic mites of the mountain beaver (*Alpiondontia rufa*) from Oregon. Northwest Science 53(4):264-267.
- Whiteside, Richard W., and Fred S. Guthery.
1979. Effects of macrohabitat on pheasants in the Texas Panhandle. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 63.
- Wick, Herbert L., and Paul R. (Rod) Canutt.
1979. Impacts on wood production, chapter 10. *In* Wildlife habitats in managed forests — the Blue Mountains of Oregon and Washington. U.S. Dep. Agric., Agricultural Handbook 553. p. 148-161.
- Wiggers, Ernie P., and Sam L. Beasom.
1979. Characterization of adjacent mule and white-tailed deer habitat in the Texas Panhandle. *In* Research highlights — 1979: noxious brush and weed control; range and wildlife management. Ronald E. Sosebee and Henry Wright, eds. Texas Tech University, Lubbock. p. 45-46.
- Wiggers, Ernie P., D. Lamar Robinette, John R. Sweeney, and others.
1978. Predictability of deer forages using overstory measurements. Proceedings 32nd Annual Conference, Southeastern Association of Fish and Wildlife Agencies [Hot Springs, Va., November 1978]. p. 187-194.
- Wigley, Thomas B., David E. Wesley, Carroll J. Perkins, and Alfred D. Sullivan.
1980. Use of a cottonwood monoculture by white-tailed deer. Journal of Wildlife Management 44(1):264-265.
- Wolfe, James L., and Robert L. Echer.

Environment

Wolff, Jerry O.

1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecology Monograph* 50(1):111-130.

Wolff, Jerry O., and Martha F. Johnson.

1979. Scent marking in taiga voles, *Microtus xanthognathus*. *Journal of Mammalogy* 60(2):400-404.

Wolff, Jerry O., and John C. Zasada.

1979. Moose habitat and forest succession on the Tanana River floodplain and Yukon-Tanana upland. *Proceedings North American Moose Conference and Workshop* 15:213-244.

Range

Baker, R. L., and J. Powell.

1979. Western Oklahoma sandhill prairie yield and crude protein response to atrazine, nitrogen, and 2,4-D during drought. *In* *Arid land plant resources*. J. R. Goodin and D. K. Northington, eds. Intermountain Center for Arid and Semi-arid Land Studies, Texas Tech University, Lubbock. p. 564-573.

Blaisdell, James P., and Lee A. Sharp.

1979. History of rangeland use and administration. *In* *Rangeland Ecosystem Evaluation and Management* [Proceedings 45th Workshop of the United States / Australia Rangeland Panel, Alice Springs, 1974]. Australian Rangeland Society, Perth, Western Austr. p. 1-24.

Brown, R. W.

1980. Revegetation with native and introduced plant species. *In* *Proceedings 26th Grass Breeders Conference*, Utah State University, Logan. p. 1-8.

Brown, Ray W., and James M. Collins.

1979. Protection of instrument wires in the field. *Journal of Range Management* 32(6):476-479.

Brown, Ray W., and Robert S. Johnston.

1979. Rehabilitation of disturbed alpine rangelands. *In* *Proceedings 1st Intermountain Rangeland Congress*. Society for Range Management, Denver, Colo. p. 704-706.

Buckhouse, John C., Robert W. Knight, and Jon M. Skovlin.

1979. Some erosional and water quality responses to selected animal grazing practices in northeastern Oregon. *Proceedings Oregon Academy of Science* 15:13-22.

Byington, E. K.

1980. How is it being utilized. *In* *Proceedings Southern Forest Range and Pasture Resources Symposium*. Winrock International, Morrilton, Ark. p. 29-57.

Cable, Dwight R.

1979. Ecology of Arizona cottontop. U.S. Dep. Agric. For. Serv. Research Paper RM-209. 21 p.

Cable, Dwight R.

1980. Seasonal patterns of soil water recharge and extraction on semidesert ranges. *Journal of Range Management* 33(1):9-15.

Child, R. Dennis.

1980. Evaluating interactions. *In* *Proceedings Southern Forest Range and Pasture Resources Symposium*. Winrock International, Morrilton, Ark. p. 147-163.

Clary, Warren P.

1979. Variation in leaf anatomy and CO₂ assimilation in *Sitanion hystrix* ecotypes. *Great Basin Naturalist* 39(4):427-432.

Clary, Warren P., and William H. Kruse.

1979. Phenology and rate of height growth of some forbs in the southwestern ponderosa pine type. U.S. Dep. Agric. For. Serv. Research Note RM-376. 8 p.

Dewey, D. R., and A. P. Plummer.

1980. New collections of range plants from the Soviet Union. *Journal of Range Management* 33(2):89-94.

Dietz, Donald R., Daniel W. Uresk, Harold E. Messner, and Lowell C. McEwen.

1980. Establishment, survival, and growth of selected browse species in a ponderosa pine forest. U.S. Dep. Agric. For. Serv. Research Paper RM-219. 11 p.

Eddleman, Lee E.

1979. Germination in black greasewood (*Sarcobatus vermiculatus*) (Hook. Ton.). *Northwest Science* 53(4):289-294.

Eddleman, Lee E.

1979. Regeneration strategies of mixed prairie species. *In* *Arid land plant resources*. J. R. Goodin and David K. Northington, eds. Texas Tech University, Lubbock. p. 686-698.

Francis, R. E., M. J. Morris, R. J. Myhre, and D. L. Noble.

(no date) Inventory and analysis of leafy spurge (*Euphorbia esula*) sites. . . a feasibility study. *In* *Proceedings Northern Regional Leafy Spurge Conference* [Billings, Mont., December 17-18, 1979]. Montana Department of Agriculture, Helena, and Montana State University, Bozeman. 3 p.

Freckman, Diana W., Don A. Duncan, and Jeanne R. Larson.

1979. Nematode density and biomass in an annual grassland ecosystem. *Journal of Range Management* 32(6):418-422.

Hagedorn, C., V. H. Watson, and W. E. Knight.

1980. Forage legumes in a forested environment. *In* *Proceedings Southern Forest Range and Pasture Resources Symposium*. Winrock International, Morrilton, Ark. p. 143-145.

- Haney, Harry L., Jr.
1980. Economics of integrated cattle-timber land use. *In* Proceedings Southern Forest Range and Pasture Resources Symposium. Winrock International, Morrilton, Ark. p. 165-183.
- Harberd, D. J., and E. D. McArthur.
1980. Meiotic analysis of some species and genus hybrids in the *Brassicaceae*. *In* Brassica crops and wild allies: biology and breeding. S. Tsunoda, K. Hinata, and C. Gomez-Campo, eds. Japan Scientific Societies Press, Tokyo. p. 65-87.
- Holechek, J. L., M. Vavra, J. M. Skovlin, and R. L. Phillips.
1979. Cattle performance under three grazing systems in northeastern Oregon. *In* 1979 progress report. . . research in beef cattle nutrition and management. Oregon State University, Corvallis, Agricultural Experiment Station Special Report 534. p. 5-9.
- Knipe, O. D., C. P. Pase, and R. S. Carmichael.
1979. Plant species of the Arizona chaparral. U.S. Dep. Agric. For. Serv. General Technical Report RM-64. 54 p.
- Martin, S. Clark, and Howard L. Morton.
1980. Responses of falsemesquite, native grasses and forbs, and Lehmann lovegrass after spraying with picloram. *Journal of Range Management* 33(2):104-106.
- McArthur, E. Durant, and C. Lorenzo Pope.
1979. Karyotypes of four *Artemisia* species: *A. carruthii*, *A. filifolia*, *A. frigida*, and *A. spinescens*. *Great Basin Naturalist* 39(4):419-426.
- McNabb, D. H., and J. M. Geist.
1979. Acetylene reduction assay of symbiotic N₂ fixation under field conditions. *Ecology* 60(5):1070-1072.
- Medin, Dean E., and Robert B. Ferguson.
1980. A pilot planting trial on a southwestern Idaho deer winter range. U.S. Dep. Agric. For. Serv. Research Paper INT-261. 13 p.
- Mueggler, W. G., and W. L. Stewart.
1980. Grassland and shrubland habitat types of western Montana. U.S. Dep. Agric. For. Serv. General Technical Report INT-66. 154 p.
- Musselman, Lytton J., and Harold E. Grelen.
1979. A population of *Aureolaria pedicularia* (1.) Raf. (*Scrophulariaceae*) without oaks. *The American Midland Naturalist* 102(1):175-177.
- Noble, Daniel L.
1980. Evidence for leafy spurge dissemination by birds? *Weed Science Society of America Newsletter* 8(3):8.
- Noble, Daniel L.
1980. Leafy spurge — evaluational and educational needs. *In* Proceedings Northern Regional Leafy Spurge Conference [Billings, Mont., December 17-18, 1979]. Montana Department of Agriculture, Helena, and Montana State University, Bozeman. p. 15-17.
- Noble, Daniel L., Paul H. Dunn, and Lloyd A. Andres.
1979. The leafy spurge problem. *In* Proceedings Leafy Spurge Symposium [June 26-27, 1979, Bismarck, N.D.]. North Dakota State University Cooperative Extension Service, Fargo, N.D. p. 8-15.
- Noble, Daniel L., and Daniel C. MacIntyre.
1979. Management program for leafy spurge. *Rangelands* 1(6):247.
- Pearson, H. A.
1979. Range opportunities in the south. *Rangelands* 1(5):179-181.
- Pearson, Henry A.
1980. Livestock in multiple-use management of southern forest range. *In* Proceedings Southern Forest Range and Pasture Resources Symposium. Winrock International, Morrilton, Ark. p. 75-88.
- Pearson, H. A., R. D. Child, E. K. Byington, and others.
1980. Selected bibliography on southern range management, 1973-1979. U.S. Dep. Agric. For. Serv. General Technical Report SO-31. 72 p.
- Probasco, G. E., and A. J. Bjugstad.
1980. Influence of fertilizer, aspect and harvest date on chemical constituents and *in vitro* digestibility of tall fescue. *Journal of Range Management* 33:244-246.
- Ratliff, Raymond D.
1980. Decomposition of native herbage and filter paper at five meadow sites in Sequoia National Park, California. *Journal of Range Management* 33(4):262-266.
- Rivers, James W., and S. Clark Martin.
1980. Perennial grass improves with moderate stocking. *Rangelands* 2(3):105-106.
- Sabo, David G., Gordon Johnson, William C. Martin, and Earl F. Aldon.
1979. Germination requirement of 19 species of arid land plants. U.S. Dep. Agric. For. Serv. Research Paper RM-210. 26 p.
- Stoner, D. L., A. P. Lucido, J. W. Stuth, and others.
1980. An implantable telemetry system for monitoring grazing dynamics of wild and domestic ungulates. *Biomedical and Scientific Instruments* 16:123-128.
- Uresk, D. W., W. H. Rickard, and J. F. Cline.
1980. Perennial grasses and their response to a wildfire in south-central Washington. *Journal of Range Management* 33(2):111-114.

Welch, Bruce L., and E. Durant McArthur.

1979. Feasibility of improving big sagebrush (*Artemisia tridentata*) for use on mule deer winter ranges. In *Arid land plant resources*. J. R. Goodin and David K. Northington, eds. Intermountain Center for Arid and Semi-Arid Land Studies, Texas Tech University, Lubbock. p. 451-473.

Welch, Bruce L., and E. Durant McArthur.

1979. Variation in winter levels of crude protein among *Artemisia tridentata* subspecies grown in a uniform garden. *Journal of Range Management* 32(6):467-469.

West, Neil E.

1980. Survival patterns of major perennials in salt desert shrub communities of southwestern Utah. *Journal of Range Management* 32:442-445.

Westfall, Stanley E., and Raymond D. Ratliff.

1979. Tilling may improve annual plant rangelands. *Rangelands* 1(6):246-247.

Fisheries Habitat

Bowers, Wayne, Bill Hosford, Art Oakley, and Carl Bond.

1979. Wildlife habitats in managed rangelands — the Great Basin of southeastern Oregon: native trout. U.S. Dep. Agric. For. Serv. General Technical Report PNW-84. 16 p.

Bryant, Mason D.

1980. Evolution of large, organic debris after timber harvest: Maybeso Creek, 1949 to 1978. U.S. Dep. Agric. For. Serv. General Technical Report PNW-101. 30 p.

Bryant, Mason D., and William J. Walkotten.

1980. Carbon dioxide freeze-branding device for use on juvenile salmonids. *Progressive Fish-Culturist* 42(1):55-56.

Cline, L.D., R.A. Short, J.V. Ward, and C.A. Carlson.

1979. The inertia and resiliency of a mountain stream to construction impact. In *The Mitigation Symposium: A National Workshop on Mitigating Losses of Fish and Wildlife Habitats* (July 16-20, 1979, Fort Collins, Colo.). G.A. Swanson, technical coordinator. U.S. Dep. Agric. For. Serv. General Technical Report RM-65. p. 617-620.

Constantz, George D.

1979. Life history patterns of livebearing fish in contrasting environments. *Oecologia* (Berlin) 40:189-201.

Everest, Fred H.

1978. Anadromous fish habitat and forest management — economic considerations. In *Western Proceedings 58th Annual Conference Western Association of Fish and Wildlife Agencies*. p. 153-171.

Everest, Fred H., Carl E. McLemore, and John F. Ward.

1980. An improved tri-tube cryogenic gravel sampler. U.S. Dep. Agric. For. Serv. Research Note PNW-350. 8 p.

Fisher, Carla J., and Charles D. Ziebell.

1980. Effects of watershed use on water quality and fisheries in an Arizona mountain lake. *Eisenhower Consortium Bulletin* 7. 8 p.

Gurtz, M.E., J.P. Webster, and J.B. Wallace.

1979. Seston dynamics in southern Appalachian streams: effects of clearcutting. *Canadian Journal of Fisheries and Aquatic Sciences* 37:624-631.

Harshbarger, Thomas J.

1979. Scraping improves silver nitrate brands on trout. *Progressive Fish-Culturist* 41:209.

Harshbarger, Thomas J., and Pamela E. Porter.

1979. Survival of brown trout eggs: two planting techniques compared. *Progressive Fish-Culturist* 41:206-209.

Megahan, Walter F., William S. Platts, and Bert Kulesza.

1980. Riverbed improves over time: South Fork Salmon. In *Symposium on Watershed Management 1980*. American Society of Civil Engineers, New York. p. 380-395.

Platts, William S.

1979. Including the fishery system in land planning. U.S. Dep. Agric. For. Serv. General Technical Report INT-60. 37 p.

Platts, William S.

1980. A plea for fishery habitat classification. *Fisheries* 5(1):2-6.

Platts, William S., and Susan B. Martin.

1980. Return of the South Fork Salmon. *Idaho Wildlife* 2(4):3-9.

Platts, William S., Susan B. Martin, and Edward R. J. Primbs.

1979. Water quality in an Idaho stream degraded by acid mine waters. U.S. Dep. Agric. For. Serv. General Technical Report INT-67. 19 p.

Platts, William S., and Vance E. Penton.

1980. A new freezing technique for salmonid redds. U.S. Dep. Agric. For. Serv. Research Paper INT-248. 22 p.

Reiser, D.W., and T.C. Bjornn.

1979. Influence of forest and rangeland management on anadromous fish habitat in western North America. 1. Habitat requirements of anadromous salmonids. U.S. Dep. Agric. For. Serv. General Technical Report PNW-96. 54 p.

Rinne, John N.

1980. Spawning habitat and behavior of Gila trout, a rare salmonid of the southwestern United States. *Transactions of American Fisheries Society* 109:83-91.

Rinne, John N., Bryce Rickel, and Dean Hendrickson.
1980. A new Gila topminnow locality in southern Arizona. U.S. Dep. Agric. For. Serv. Research Note RM-362. 4 p.

Rinne, John N., Ben Robertson, Ron Major, and Ken Harper.
1979. Sport fishing for the native Arizona trout, *Salmo apache* Miller in Christmas Tree Lake: A case study. In Wild Trout II Symposium [Mammoth, Wyo., September 24-25]. 7 p.

Short, Robert A., and James V. Ward.
1980. Life cycle and production of *Skwala parallela* (Frison) (Plecoptera Perlodidae) in a Colorado montane stream. Hydrobiologia 69(3):273-275.

Short, Robert A., and James V. Ward.
1980. Macroinvertebrates of a Colorado high mountain stream. The Southwestern Naturalist 25(1):23-32.

Swanston, Douglas N.
1980. Influence of forest and rangeland management on anadromous fish habitat in western North America. 2. Impacts of natural events. U.S. Dep. Agric. For. Serv. General Technical Report PNW-104. 27 p.

Wolkott, William J., and Mason D. Bryant.
1980. An instrument to measure stream channel gradient and profiles. U.S. Dep. Agric. For. Serv. Research Note PNW-345. 5 p.

Wallace, J.B., and J. O'Hop.
1979. Fine particle suspension feeding capabilities of *Isonychia* spp. (Ephemeroptera: Siphonuridae). Annals of the Entomological Society of America 72:353-357.

Webster, J.R., and B.C. Patten.
1979. Effect of watershed perturbation on stream potassium and calcium dynamics. Ecological Monographs 49:51-72.

Wesche, T.A., and P.A. Rechard.
1980. A summary of instream flow methods for fisheries and related research. Eisenhower Consortium Bulletin 9. 128 p.

Forest Recreation

Benson, Robert E.
1980. Esthetic impacts of harvesting and residue management: public preference rating. In Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 433-440.

Christensen, Harriet H., and Roger N. Clark.
1978. Understanding and controlling vandalism and other rule violations in urban recreation areas. In Proceedings National Urban Forestry Conference, Volume I. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 63-84.

Christensen, Harriet H., Robert E. Pacha, Kevin J. Varness, and Robert F. Lapen.
1979. Human use in a dispersed recreation area and its effect on water quality. In Recreational Impact on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 107-119.

Clark, Roger N., and George H. Stankey.
1979. Determining the acceptability of recreational impacts: an application of the Outdoor Recreation Opportunity Spectrum. In Recreational Impact on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 32-42.

Clark, Roger N., and George H. Stankey.
1979. The recreation opportunity spectrum: a framework for planning, management, and research. U.S. Dep. Agric. For. Serv. General Technical Report PNW-98. 32 p.

Cole, David N.
1979. Reducing the impact of hikers on vegetation: an application of analytical research methods. In Recreational Impact on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 71-78.

Cole, G.L., and W.F. LaPage.
1980. Camping and RV travel trends. In Proceedings 1980 National Outdoor Recreation Trends Symposium, Volume I. U.S. Dep. Agric. For. Serv. General Technical Report NE-57. p. 165-177.

Cordell, H. Ken.
1980. The status and future of outdoor recreation on the South's private forests. Proceedings Recreation in South's Third Forests [Baton Rouge, La., April 1979]. Charles L. Shilling, ed. Louisiana State University, Baton Rouge. p. 5-31.

Cordell, H. Ken, and L.M. Anderson.
1980. Outdoor recreation research: current activities and needs. In Appendix to 1980 Proceedings National Outdoor Recreation Trends Symposium. U.S. Dep. Agric. For. Serv. General Technical Report NE-57. p. 2-15.

Cordell, H. Ken, Robert W. McLellan, and Michael H. Legg.
1980. Managing private rural land as a visual resource. In Tourism Planning and Development Issues. Intermountain Symposium on Tourism and Next Decade. Donald E. Hawkins, Elwood L. Shafer, and James M. Rovelstad, eds. George Washington University, Washington, D.C. p. 87-97.

- Cordell, Harold K., Michael H. Legg, and Robert W. McLellan.
1980. The private outdoor recreation estate. *In* The Federal Role in Private Outdoor Recreation, Appendix to the Nationwide Outdoor Recreation Plan. U.S. Department of the Interior, Heritage Conservation Recreation Service, Washington, D.C. p. 39-83.
- Crandall, Rick.
1980. Motivations for leisure. *Journal of Leisure Research* 12(1):45-54.
- Daniel, Terry C., Ervin H. Zube, and B.L. Driver, technical coordinator.
1979. Assessing amenity resource values. Workshop, Ninth Annual Meeting, Environmental Design Research Association [April 10-11, 1978, University of Arizona, Tucson]. U.S. Dep. Agric. For. Serv. General Technical Report RM-68. 70 p.
- Downing, Kent, and Roger N. Clark.
1979. Users' and managers' perceptions of dispersed recreation impacts: a focus on roaded forest lands. *In* Recreational Impact on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 18-23.
- Driver, B.L.
1980. Outdoor recreation, a developing profession. *In* Proceedings Trails and Rivers Symposium [November 7-8, 1979]. Wyoming Recreation Commission, Cheyenne. p. 30-33.
- Dwyer, John F., John R. Kelly, Michael D. Bowes, and Marianne Bowes.
1979. Needed improvements in recreation benefit estimation. *Journal of Leisure Research* 11(4):327-333.
- Echelberger, Herbert E., and J. Alan Wagar.
1979. Noncommodity values of forests and woodlands. *In* Planning the Uses and Management of Land. American Society of Agronomy-Crop Science Society of America-Soil Science Society of America Agronomy Monograph 21. p. 429-443.
- Elsner, Gary H.
1979. Computers and the landscape. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.] U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 88-92.
- Elsner, G.H., A.W. Magill, C.F. Schwarz, and E.C. Thor.
1979. Planning other land uses for public rangelands. *In* Planning the Uses and Management of Land. American Society of Agronomy-Crop Science Society of America-Soil Science Society of America Agronomy Monograph 21. p. 335-362.
- Erickson, D.L., C.J. Liu, and H.K. Cordell.
1980. Automatic, time-interval traffic counts for recreation area management planning. *In* Proceedings 1980 National Outdoor Recreation Trends Symposium, Volume II. U.S. Dep. Agric. For. Serv. General Technical Report NE-57. p. 115-124.
- Field, Rebecca, R.E. Leonard, E.L. Spencer, and Vicky Van Steenberg.
1979. Role of volunteers in research. *In* Long Distance Trails. William R. Burch, Jr., ed. Yale University, New Haven, Conn. p. 33-37.
- Frissell, Sidney S., Jr., Robert G. Lee, George H. Stankey, and Ervin H. Zube.
1980. A framework for estimating the consequences of alternative carrying capacity levels in Yosemite Valley. *Landscape Planning* 7:151-170.
- Gerhold, H.D., W.D. Bartoe, and C.J. Sacksteder.
1979. Selecting and growing better landscape trees for northeastern United States: practices of arborists and nurserymen. *Pennsylvania Agricultural Experiment Station Bulletin* 829. 20 p.
- Gerking, Shelby D.
1980. A short term forecasting model for second home construction. *Regional Studies* 13:259-267 [Eisenhower Consortium Journal Series Paper 24].
- Greenleaf, R. D., and M. Wiley.
1980. New Hampshire recreation and tourism data bank. School of Health Studies, University of New Hampshire, Durham. 56 p.
- Haas, G.E., B.L. Driver, and P.J. Brown.
1980. A study of ski touring experiences on the White River National Forest. *In* Proceedings North American Symposium on Dispersed Winter Recreation [February 27-29, 1980, University of Minnesota, St. Paul].
- Haas, Glen E., Deborah J. Allen, and Mike J. Manfredo.
1979. Some dispersed recreation experiences and the resource settings in which they occur. *In* Assessing Amenity Resource Values. Terry C. Daniel, Ervin H. Zube, and B. L. Driver, technical coordinator. U.S. Dep. Agric. For. Serv. General Technical Report RM-68. p. 21-26.
- Harrison, Robin R., Roger N. Clark, and George H. Stankey.
1980. Predicting impact of noise on recreationists. U.S. Dep. Agric. For. Serv. San Dimas Equipment Development Center Project Recreation. 32 p.
- Hendee, John C., Zane G. Smith, and Robert M. Lake.
1979. Public involvement in resource decisions: RARE I and II and their implications for the future. *In* Multiple-Use Management of Forest Resources Proceedings Symposium [Clemson, S.C., September 1979]. Donal D. Hook and B. Allen Dunn, eds. Clemson University, S.C. p. 217-232.
- Hogans, Mack L.
1979. A 3-year pattern of dispersed recreation and forest fires in Pacific Northwest forests. U.S. Dep. Agric. For. Serv. Research Note PNW-338. 18 p.

- Howard, Gordon E., and B.A. Stanley-Saunders.
1980. Impacts of recreation activities associated with streams: a problem analysis. Clemson University, S.C., Department of Recreation and Park Administration Research Report 16. 43 p.
- Hrubes, Robert J., Kent P. Connaughton, and Robert W. Sassaman.
1979. Roadless area-intensive management tradeoffs on the Sierra National Forest, California. U.S. Dep. Agric. For. Serv. Research Paper PSW-149. 11 p.
- King, David A.
1979. User-based assessments of the value of fish and wildlife resources. *In* Assessing Amenity Resource Values. Terry C. Daniel, Ervin H. Zube, and B.L. Driver, technical coordinator. U.S. Dep. Agric. For. Serv. General Technical Report RM-68. p. 44-47.
- Knopp, Timothy B., Gary Ballman, and Lawrence C. Merriam, Jr.
1979. Toward a more direct measure of river user preferences. *Journal of Leisure Research* 11(4):317-326.
- LaPage, W.F.
1980. The camping market and the camping industry. *In* Campgrounds and Camping 1980, Proceedings of a Conference at Land Between the Lakes, Brandon Spring, Tenn., November 1978. Southern Illinois University, Carbondale. p. 56-62.
- LaPage, W.F., and G.L. Cole.
1980. 1978 national camping market survey. U.S. Dep. Agric. For. Serv. Research Paper NE-450. 34 p.
- Leatherberry, Earl C.
1979. River amenity evaluation: a review and commentary. *Water Resources Bulletin* 15(5):1281-1292.
- Leatherberry, Earl C.
1980. Unstaffed trail registration compliance in backcountry recreation area: some preliminary findings. *In* Fifth National Trail Symposium, Duluth, Minn. p. 103-104.
- Leatherberry, Earl C.
1980. Comparing attitudes of Wisconsin residents and snowmobilers regarding use of snowmobiles in public land. *In* North American Symposium on Dispersed Winter Recreation Proceedings. Office of Special Programs, Agriculture Extension Service, University of Minnesota Education Service 2-3:78-81.
- Leatherberry, Earl C., David W. Lime, and Jerrilyn LaVarre Thompson.
1980. Trends in river recreation. *In* Proceedings 1980 National Outdoor Recreation Trends Symposium. U.S. Dep. Agric. For. Serv. General Technical Report NE-57. p. 147-164.
- Leonard, R.E.
1979. Physical and biological carrying capacity considerations in trails planning. *In* Proceedings Trails and Rivers Symposium [November 7-8, 1979]. Wyoming Recreation Commission, Cheyenne.
- Leonard, R.E.
1979. Protecting the long trail resource: a problem analysis. *In* Long Distance Trails. William R. Burch, Jr., ed., Yale University, New Haven, Conn. p. 84-104.
- Leonard, R.E., H.E. Echelberger, H.J. Plumley and L.W. Van Meter.
1980. Management guidelines for monitoring use on backcountry trails. U.S. Dep. Agric. For. Serv. Research Note NE-286. 20 p.
- Leonard, R.E., and H.J. Plumley.
1979. The use of soils information for dispersed recreation planning. *In* Recreational Impacts on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 50-63.
- Lime, David W.
1980. River recreation research: a nationwide perspective. *In* Trails and Rivers Symposium Proceedings [November 7-8, 1979]. Wyoming Recreation Commission, Cheyenne. p. 115-126.
- Litton, R. Burton, Jr.
1979. Descriptive approaches to landscape analysis. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.]. U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 77-87.
- Litton, R. Burton, Jr.
1980. Applying visual research concepts and methods from forestry to the urban scene. *In* Proceedings National Urban Forestry Conference, Volume II. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 340-348.
- Litton, R. Burton, Jr., and Philip M. McDonald.
1980. Silviculture and visual resources. *In* Proceedings Society of American Foresters. p. 97-102.
- Litton, R. Burton, Jr., and Robert J. Tetlow.
1978. A landscape inventory framework: scenic analyses of the Northern Great Plains. U.S. Dep. Agric. For. Serv. Research Paper PSW-135. 83 p.
- Lucas, Robert C.
1979. Perceptions of non-motorized recreational impacts: a review of research findings. *In* Recreational Impact on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 24-31.
- Lucas, Robert C.
1980. Use patterns and visitor characteristics, attitudes, and preferences in nine wilderness and other roadless areas. U.S. Dep. Agric. For. Serv. Research Paper INT-253. 89 p.

- Manning, R.E., and P.L. Cormier.
1980. Trends in the temporal distribution of park use. *In* Proceedings 1980 National Outdoor Recreation Trends Symposium, Volume II. U.S. Dep. Agric. For. Serv. General Technical Report NE-57. p. 81-87.
- Minore, Don, Alan W. Smart, and Michael E. Dubrasich.
1979. Huckleberry ecology and management research in the Pacific Northwest. U.S. Dep. Agric. For. Serv. General Technical Report PNW-93. 50 p.
- Mitchell, Rod.
1979. A checklist of the vascular plants in Abbott Creek Research Natural Area, Oregon. U.S. Dep. Agric. For. Serv. Research Note PNW-341. 18 p.
- Moeller, G., M. Mescher, T. More, and E. Shafer.
1980. The informal interview as a technique for recreation research. *Journal of Leisure Research* 12(2):174-182.
- More, T.
1979. Wildlife preferences and children's books. *Wildlife Society Bulletin* 7(4): 274-278.
- More, T.
1980. Emotional responses to recreation environments. U.S. Dep. Agric. For. Serv. Research Paper NE-461. 8 p.
- More, T.
1980. Trail deterioration as an indicator of trail use in an urban forest recreation environment. U.S. Dep. Agric. For. Serv. Research Note NE-292. 4 p.
- Muth, Robert M., and John C. Hendee.
1980. Technology transfer and human behavior. *Journal of Forestry* 78:141-144.
- Omi, Philip, Lee C. Wensel, and James L. Murphy.
1979. An application of multi-variate statistics to land-use planning: classifying land units into homogeneous zones. *Forest Science* 25(3):394-417.
- Peterson, George L.
1979. Appendix A to the relationships between recreation and instream flow. *In* Workshop in Instream Flow Habitat Criteria and Modeling. G.L. Smith, ed. Colorado Water Resources Research Institute, Colorado State University, Ft. Collins. p. 195-232.
- Peterson, George L., and James deBettencourt.
1979. Flow-metering of wilderness travel in the Quetico-Superior: new findings and research needs. *Modeling and Simulation* 10(3):1335-1340.
- Peterson, G.L., G. Howard, William Honore, and D.W. Lime.
1979. The relationships between recreation and instream flow. *In* Workshop in Instream Flow Habitat Criteria and Modeling. G.L. Smith, ed. Colorado Water Resources Research Institute, Colorado State University, Ft. Collins. p. 167-194.
- Peterson, George L., and David W. Lime.
1980. Recreation policy analysis in wilderness management: a case study of the Quetico-Superior. *In* Third Annual Applied Geography Conference Proceedings. John W. Frazier and Bart J. Epstein, eds. Department of Geography, State University of New York/Binghamton, Binghamton, N.Y. and Department of Geography, Kent State University, Kent, Ohio. p. 4-13.
- Ragatz, Richard L., and H. Ken Cordell.
1980. A comprehensive bibliography on vacation homes and recreational lands in the United States. U.S. Dep. Agric. For. Serv. Research Paper SE-202. 31 p.
- Ream, Catherine H.
1979. Human-wildlife conflicts in backcountry: possible solutions. *In* Recreational Impact on Wildlands, Conference Proceedings. Ruth Ittner and others, eds. U.S. Dep. Agric. For. Serv. R-6-001-1979. p. 153-163.
- Ream, Catherine H.
1980. Impact of backcountry recreationists on wildlife: an annotated bibliography. U.S. Dep. Agric. For. Serv. General Technical Report INT-84. 62 p.
- Rensi, Guisepppe.
1979. Some aspects and issues in goal formulation. *In* Proceedings of the Multiple Objective Planning Workshop [February 27-March 1, 1979, Tucson, Ariz.]. University of Arizona, College of Agriculture Miscellaneous Report 7. p. 135-146.
- Rosenthal, Donald H., and B.L. Driver.
1980. Skiing environments preferred by Colorado ski-tourers. *In* Proceedings North American Symposium on Dispersed Winter Recreation [February 27-29, 1980, University of Minnesota, St. Paul]. p. 57-63.
- Russell, Robert, Edward C. Thor, and Gary H. Elsner.
1979. GPLUS . . . a new program for multiple objective planning. *In* Proceedings of the Multiple Objective Planning Workshop [February 27-March 1, 1979, Tucson, Ariz.]. University of Arizona, College of Agriculture Miscellaneous Report 7. p. 60-79.
- Saunders, P.R.
1980. Analysis of U.S. Forest Service inventory data of the non-developed rural recreation resources in South Carolina: Southern Coastal Plain. Clemson University, S.C., Department of Recreation and Park Administration Research Report 18. 101 p.
- Saunders, P.R.
1980. Analysis of U.S. Forest Service inventory data of the non-developed rural recreation resources in South Carolina: Northern Coastal Plain. Clemson University, S.C., Department of Recreation and Park Administration Research Report 17. 103 p.

Saunders, Paul Richard.

1979. Inventory method tested: recreation data from a multi-resource inventory. *Parks and Recreation* 14(12):56.

Saunders, Paul Richard.

1979. Prediction of nondeveloped recreation sites in South Carolina using U.S. Forest Service renewable resource evaluation data. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 63-71.

Schechter, M., and R.C. Lucas.

1980. On the optimal use of natural and scenic resources for recreation. *Resource Management and Optimization* 1(1):1-27.

Schomaker, John H.

1979. Measurement of preferences for proposed landscape modifications. *In* Assessing Amenity Resource Values. Terry C. Daniel, Ervin H. Zube, and B.L. Driver, technical coordinators. U.S. Dep. Agric. For. Serv. General Technical Report RM-68. p. 67-70.

Smardon, Richard C.

1979. The interface of legal and esthetic considerations. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.]. U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 676-685.

Smardon, Richard C., Gary H. Elsner, and George C. Coombs.

1979. Conference orientation for our national landscape: an experiment in creative conference programming. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.]. U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 4-5.

Spencer, Edward, H.E. Echelberger, R.E. Leonard, and Craig Evans.

1980. Trends in hiking and backcountry use. *In* Proceedings 1980 National Outdoor Recreation Trends Symposium. U.S. Dep. Agric. For. Serv. General Technical Report NE-57. p. 195-198.

Stankey, George H.

1980. A comparison of carrying capacity perceptions among visitors to two wildernesses. U.S. Dep. Agric. For. Serv. Research Paper INT-242. 34 p.

Stankey, George H.

1980. A framework for social-behavioral research on the Appalachian Trail. *In* Long Distance Trails. William R. Burch, Jr., ed. Yale University, New

Stankey, George H.

1980. What have we learned: a symposium summary. *In* Dispersed Recreation and Natural Resource Management, a Symposium. Joan Shaw, ed. Utah State University, Logan, College of Natural Resources. p. 88-91.

Travis, Michael.

1979. Geographical display techniques for public land planning. *In* Proceedings of the Multiple Objective Planning Workshop [February 27-March 1, 1979, Tucson, Ariz.]. University of Arizona, College of Agriculture Miscellaneous Report 7. p. 113-120.

Wagar, J. Alan.

1980. Effectiveness in interpretation: let OPEC be our guide. *In* Proceedings California State Park Rangers Association-Western Interpreters Association-Park Rangers Association of California Workshop-Convention [Santa Cruz, Calif., March 7-9, 1980]. p. 42-48.

Wendling, Robert C.

1980. Mail questionnaires: are they dependable? *Parks and Recreation* (March): 53-54.

Urban Forestry

Ames, Richard G.

1980. The sociology of urban tree planting. *Journal of Arboriculture* 6(5):120-123.

Ames, Richard G.

1980. Urban tree planting programs: a sociological perspective. *HortScience* 15(2):135-137.

Ames, Richard G., and Arthur W. Magill.

1980. Urban trees — A link to social well-being. *In* Proceedings Society of American Foresters, 1979. p. 283-287.

Anderson, L.M.

1979. Discussion of the esthetic benefits from urban trees. *Proceedings National Urban Forestry Conference*. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 428-430.

Anderson, L.M.

1980. Discussion of noise reduction benefits from urban trees. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 426-427.

Environment

- Barker, Philip A.
1980. Some key aspects of tree ordinances. *In* Proceedings National Urban Forestry Conference, Volume II. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 724-729.
- Bartoe, W.D., and H.D. Gerhold.
1979. Experimental designs for comparing landscape tree cultivars under city conditions. *In* Northeast Forest Tree Improvement Conference Proceedings 26:140-160.
- Brown, T.L., D.J. Miller, and B.T. Wilkins.
1979. Rural nonfarmed lands and their owners in five central New York counties. Cornell University Agricultural Experiment Station, Ithaca, N.Y. Agriculture Natural Research 2. 7(4).
- Brush, R.O.
1980. Forests can be managed for aesthetics: a study for forest landowners in Massachusetts. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 349-360.
- Cook, D.I.
1980. Trees, solid barriers, and combinations: alternatives for noise control. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 330-339.
- Corbett, E.S.
1980. Employing the urban forest for water quality and quality control. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 431-432.
- Corbett, E.S.
1980. Water resources in the urban forest environment. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 361-367.
- Cordell, H. Ken.
1979. Multiple use of urban forests. *In* Multiple-Use Management of Forest Resources, Proceedings Symposium [Clemson, S.C., September 1979]. Donal D. Hook and B. Allen Dunn, eds. Clemson University, S.C. p. 107-120.
- Cordell, H.K., and Y.C. Berisford.
1980. Major tree and insect disease problems. Ornamental South 2(3):18-21.
- Dean, J., and G. Singer.
1979. Open space preservation in the New Jersey pinelands. Princeton University, Center for Environmental Studies Report PU/CES 79.
- Dewalle, D.R.
1980. Manipulating urban vegetation for residential energy conservation. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 267-283.
- Dwyer, John F.
1980. Urban forestry research for the 1980's. *In* Proceedings Society of American Foresters, 1979. p. 297-299.
- Fusillo, T.V.
1980. Water quantity and quality: urban hydrology aspects; urbanization and its impacts on water resources. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 380-391.
- Hager, Barbara C., William N. Cannon, Jr., and David P. Worley.
1980. Street tree policies in Ohio towns. Journal of Arboriculture 6(7):185-191.
- Harkov, Ronald, and Eileen Brennan.
1980. Comparison of oxidant injury in urban trees and agricultural crops in New Jersey during 1978. *In* Proceedings National Urban Forestry Conference, Volume II. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 830.
- Hartley, B.A., and W.G. Spencer.
1980. Management problems and techniques on a city watershed. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 410-420.
- Heisler, Gordon M.
1980. Report: Session I, Workshop C. *In* Proceedings National Urban Forestry Conference, Volume I. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 421-425.
- Helb, J.V.

- Herrington, Lee P.
 1978. Trees modify noise levels. *In* Urban Foresters Notebook. Silas Little, ed. U.S. Dep. Agric. For. Serv. General Technical Report NE-49. p. 25-30.
- Herrington, Lee P.
 1980. Microclimate and the urban forest. *In* Proceedings, Symposium on Urban Forestry [May 1978, Berkeley, Calif.].
- Herrington, Lee P.
 1980. Urban vegetation and microclimate. *In* Proceedings National Urban Forestry Conference, Volume I. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 256-266.
- Jennings, Aaron A., Franklin S. Tirsch, and Donald Dean Adrian.
 1979. Soil attenuative capacity and transport of solid waste leachates. *In* 33rd Industrial Wastes Conference [Purdue University, West Lafayette, Ind., 1978]. Ann Arbor Science Press.
- Kaplan, Rachel.
 1979. Visual resources and the public: an empirical approach. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.]. U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 209-215.
- Kaplan, Stephen.
 1979. Perception and landscape: conceptions and misconceptions. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.]. U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 241-248.
- Karnosky, D.F.
 1980. Consistency from year to year in the response of *Fraxinus pennsylvanica* provences to ozone. *In* Proceedings International Union of Forestry Research Organizations Air Pollution Meeting [August 27-29, 1979, Zabrze, Poland].
- Kielbaso, J.J., ed.
 1979. Proceedings of the Symposium on Systemic Chemical Treatments in Tree Culture. The Kellogg Center for Continuing Education, Michigan State University, East Lansing. 357 p.
- Kielbaso, J. James.
 1980. Foresters in urban areas. *In* Proceedings Society of American Foresters, 1979. p. 22-27.
- Little, Silas, ed.
 1978. Urban foresters notebook. U.S. Dep. Agric. For. Serv. General Technical Report NE-49. 190 p.
- Little, S.
 1979. The pine barrens of New Jersey, chapter 19. *In* Heathlands and Related Shrublands of the World. Elsevier, Amsterdam, R.L. Specht, ed. p. 451-464.
- Litton, R.B., Jr.
 1980. Applying visual research concepts methods from forestry to the urban scene. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 340-348.
- Lynch, J.A.
 1980. Water quantity and quality: forest hydrology aspects; urbanization and its impacts on water resources. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 368-379.
- Magill, Arthur W.
 1980. URBANBASE: an information retrieval and transfer system for urban forestry. *In* Proceedings California Symposium on Urban Forestry [May 19-20, 1978, Berkeley, Calif.]. p. 64-69.
- Magill, Arthur W.
 1980. URBANBASE: key to urban forestry information. *Journal of Arboriculture* 6(4):101-104.
- Magill, Arthur W., Rowan A. Rowntree, and Robert O. Brush.
 1979. Visual impacts in the urban-wildland interface. *In* Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [April 23-25, 1979, Incline Village, Nev.]. U.S. Dep. Agric. For. Serv. General Technical Report PSW-35. p. 25-30.
- Mattingly, George E., David T. Harje, and Gordon M. Heisler.
 1979. The effectiveness of an evergreen windbreak for reducing residential energy consumption. *In* Transactions American Society of Heating, Refrigerating and Air Conditioning Engineers (1979). Number 2, p. 428-444.
- McCurdy, T.
 1980. Open space as an air resource management strategy. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 306-320.
- Miller, David R., and Gordon M. Heisler.
 1980. Amenity values of urban trees. *In* A Guide for Communities: Street Trees in Southern New England. T.P. Husband, J.M. Lawrence, III, and A.R. Knight, eds. University of Rhode Island, Division of Forest Environment, Rhode Island Department of Environmental Management and Cooperative Extension. p. 7-14.

Environment

National Urban Forestry.

1980. Proceedings of the National Urban Forestry Conference [November 13-16, 1978, Washington, D.C.]. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. Volume I, Session I, p. 1-432; Volume II, Sessions II and III, p. 435-874.

O'Callaghan, D.P., E.M. Gallagher, and G.N. Lanier.

1980. Field evaluation of pheromone-baited trap trees to control elm bark beetles. *Environmental Entomology* 9(2):181-185.

Pease, Robert W., and Donald Dean Adrian.

1979. Complexation between organic molecules and iron in anaerobic landfill leachate. *In* 33rd Industrial Wastes Conference Proceedings [Purdue University, West Lafayette, Ind., 1978]. Ann Arbor Science Press.

Perry, Thomas O.

1979. Constraints to the effectiveness of urban forestry programs. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 652-660.

Pizor, P.J.

1978. A review of transfer of development rights. *The Appraisal Journal* (July): 386-396.

Reethof, G., and O.H. McDaniel.

1980. Acoustics and the urban forest. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 321-329.

Richards, N.A.

1979. Modeling survival and consequent replacement needs in a street tree population. *Journal of Arboriculture* 5(1):251-255.

Rosenberger, L., and R.E. Coughlin.

1979. Planning for vegetation in urbanizing areas. Regional Science Research Institute Discussion Paper Number 115. Regional Science Research Institute, Philadelphia, Pa.

Rowntree, R.A., and J.L. Wolfe.

1980. Abstracts of urban forestry research in progress — 1979. U.S. Dep. Agric. For. Serv. General Technical Report NE-60. 72 p.

Sacksteder, C.J., and H.D. Gerhold.

Schroeder, Peter B., and Joan A. Browder.

1980. A microcomputer stochastic simulation model of seed dispersion of *Melaleuca quinquenervia*. *In* Proceedings 13th Annual Simulation Symposium [Tampa, Fla., March 1980]. V.P. Boyd, R.G. Cumings, C. Hammer, and W. Malamphy, eds. p. 27-43.

Shafer, Elwood L., and George H. Moeller.

1979. Urban forestry: its scope and complexity. *Journal of Arboriculture* 5(9): 206-209.

Smith, W.H.

1980. Urban vegetation and air quality. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publications 80-003.

Sopper, W.E., and S.N. Kerr.

1980. Potential use of forestland for recycling municipal waste water and sludge. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 392-409.

Strong, A.L.

1980. Planning and management of the urban biophysical environment. *In* Proceedings National Urban Forestry Conference. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 45-53.

U.S. Dep. Agric. For. Serv.

1979. Urban waste wood utilization: Proceedings of a Conference on Alternatives to Urban Waste Wood Disposal. U.S. Dep. Agric. For. Serv. General Technical Report SE-16. 127 p.

Van Haverbeke, David F.

1978. Trees in urban energy conservation. *In* Proceedings National Urban Forestry Conference, Volume I. State University of New York, College of Environmental Science and Forestry, Syracuse. ESF Publication 80-003. p. 183-191.

Wagar, J. Alan.

1980. Urban forestry research. *In* Proceedings, California Symposium on Urban Forestry [May 19-20, 1978, Berkeley, Calif.]. p. 62-63.

Wallner, W.E., and G.S. Walton.

1980. Biological considerations in street tree maintenance. *In* Street Trees:

Wendling, Robert C.

1979. An attitudinal comparison of resource managers and off-road motorcyclists in the southwest. *In* Planning for Trail Bike Recreation. U.S. Department of the Interior Heritage Conservation Recreation Service and Motorcycle Industrial Council. p. 78-81.

Westfall, R.D., and T. Spry.

1979. Patterns of isoenzyme variation in urban Norway maple (*Acer platanoides* L.). Western Forestry Genetic Association, Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.

Woodall, Steven L.

1979. Physiology of *Schinus*. *In* *Shinus: Technical Proceedings of a Workshop for Natural Area Managers Concerning Techniques for Shinus Control in South Florida*. Sanibel-Captiva Conservation Foundation, Sanibel Island, Fla. p. 23-42.

Woodall, Steven L.

1979. Results of several herbicide screening tests on *Schinus*. *In* *Shinus: Technical Proceedings of a Workshop for Natural Area Managers Concerning Techniques for Shinus Control in South Florida*. Sanibel-Captiva Conservation Foundation, Sanibel Island, Fla. p. 63-75.

Zisa, Robert P., Howard G. Halverson, and Benjamin B. Stout.

1980. Establishment and early growth of conifers on compact soils in urban areas. U.S. Dep. Agric. For. Serv. Research Paper NE-451. 8 p.

Disturbed Areas Rehabilitation

Barker, W.T., L. Brun, J. Enz, and others.

1980. Environmental implications of coal development: an interdisciplinary research team approach. North Dakota Farm Research Bimonthly Bulletin 38:22-26.

Barrett, James, Paul C. Deutsch, Frank G. Ethridge, and others.

1980. Procedures recommended for overburden and hydrologic studies of surface mines: Thunder Basin Project. U.S. Dep. Agric. For. Serv. General Technical Report INT-71. 106 p.

Berry, Charles R.

1979. Slit application of fertilizer tablets and sewage sludge improve initial growth of loblolly pine seedlings in the Tennessee Copper Basin. *Reclamation Review* 3:22-28.

Brown, Ray W., and Robert S. Johnston.

1979. Revegetation of disturbed alpine rangelands. *In* Special Management Needs of Alpine Ecosystems. p. 76-94.

Brown, Ray W., and Robert S. Johnston.

1980. Bioassay of alpine mine spoils for plant growth and development. U.S. Dep. Agric. For. Serv. Research Note INT-285. 11 p.

Bryan, Bradley A., and John D. Hewlett.

1979. The effect of strip mining on the head-water hydrograph of eastern Kentucky. *In* Proceedings, Symposium on Surface Mining Hydrology, Sedimentology, and Reclamation. University of Kentucky, College of Engineering, Lexington, University of Kentucky Bulletin 119. p. 51-55.

Colling, Gene, compiler.

1980. Bibliography of SEAM publications. U.S. Dep. Agric. For. Serv. General Technical Report INT-88. 20 p.

Davidson, Walter H.

1979. Results of tree and shrub plantings on low pH strip-mine banks. U.S. Dep. Agric. For. Serv. Research Note NE-285.

Deputi, Edward J., and Joe F. Coenenberg.

1979. Responses of revegetated coal strip mine spoils to variable fertilizer rates, longevity of fertilizer programs, and season of planting. Montana Agricultural Experiment Station, Bozeman, Research Report 150. 81 p.

Deutsch, Paul C., Frank G. Ethridge, William T. Franklin, and others.

1979. Overburden and hydrologic study of SEAM Thunder Basin study site, Campbell County, Wyoming. Final Report, Volume II. Surface Environment and Mining Thunder Basin Study. Colorado State University, Fort Collins. 247 p.

Everett, Richard L., Richard O. Meeuwig, and Richard I. Butterfield.

1980. Revegetation of untreated acid spoils, Leviathan Mine, Alpine County, California. California Geology 32(1):8-10.

Farmer, Eugene E., and Bland Z. Richardson.

1980. Phosphate mine dump stability and revegetation. *In* Symposium on Watershed Management 1980. American Society of Civil Engineers, New York. p. 889-897.

Harwood, Gerald.

1979. A guide to reclaiming small tailings ponds and dumps. U.S. Dep. Agric. For. Serv. General Technical Report INT-57. 44 p.

Hawkes, Clifford L.

- Israelsen, C.E., C.G. Clyde, J.E. Fletcher, and others.
1980. Erosion control during highway construction: research report. National Cooperative Highway Research Program Report. Transactions Research Board National Research Council, Washington, D.C. 30 p.
- Israelsen, C.E., C.G. Clyde, J.E. Fletcher, and others.
1980. Erosion control during highway construction; manual on principles and practices. National Cooperative Highway Research Program Report. Transactions Research Board, National Research Council, Washington, D.C. 106 p.
- Jeppson, Roland W., and Eugene E. Farmer.
1980. Composite water movement in a sloping phosphate mine dump. *In* Symposium on Watershed Management 1980. American Society of Civil Engineers, New York. p. 855-866.
- Knopp, Christopher M., and Eugene E. Farmer.
1980. Infiltration and erosion analysis of phosphate strip mine overburden. U.S. Dep. Agric. For. Serv. Research Paper INT-246. 11 p.
- Marx, Donald H.
1980. The role of mycorrhizae in forest production. *In* Proceedings Reforestation of Disturbed Sites [June 9-11, College Station, Tex.]. Texas Agricultural Extension Service.
- Marx, Donald H., and Joel D. Artman.
1979. *Pisolithus tinctorius* ectomycorrhizae improve survival and growth of pine seedlings on acid coal spoils in Kentucky and Virginia. Reclamation Review 2:23-31.
- Miller, R.V., E.E. Staffeldt, and B.C. Williams.
1979. Microbial populations in undisturbed soils and coal mine spoils in semi-arid conditions. U.S. Dep. Agric. For. Serv. Research Note RM-372. 4 p.
- Nelson, Dayton D., Richard O. Mahan, and C. Thomas King.
1980. LANDFORM: land analysis and display for mining. Mining Congress Journal 66(7):49-51.
- Olson, Richard A., and William T. Barker.
1979. Strip-mine impoundments for the birds. *Rangelands* 1:248-249.
- Power, J.F., F.M. Sandoval, and R.E. Ries.
1979. Topsoil-subsoil requirement to restore North Dakota mined land to original productivity. *Mining Engineering* (December):1708-1712.
- Richardson, B.Z.
1980. Reclamation of acid-producing spoils on a western surface mine. *In* Proceedings High-Altitude Revegetation Workshop Number 4. Colorado State University Information Series 42. p. 101-112.
- Ries, R.E., R.F. Follett, F.M. Sandoval, and J.F. Power.
1979. Planting date and water affect initial establishment of perennial vegetative communities. *In* Ecology and Coal Resource Development, Volume II. Mohan K. Wali, ed. Pergamon Press, New York. p. 899-905.
- Riley, Robert K., and Melvin L. Brown.
1978. The natural invasion of wildlife food and cover species onto bituminous coal spoil. *In* Proceedings Surface Mining and Fish/Wildlife Needs in the Eastern United States. U.S. Fish and Wildlife Service and West Virginia University, Morgantown, W. Va. Fish and Wildlife Service/Office of Biological Services 78/81. p. 376-379.
- Scholl, David G., and Earl F. Aldon.
1979. Water harvesting to establish perennial plants on semi-arid coal mine spoil. *In* Ecology and Coal Resource Development, Volume II. Mohan K. Wali, ed. Pergamon Press, New York. p. 735-739.
- Scott, M.D.
1979. Computerized evaluation of the wildlife habitat option as a post mining land use. *In* Proceedings of the Mitigation Symposium. U.S. Dep. Agric. For. Serv. General Technical Report RM-65. p. 622-623.
- Scott, M.D.
1979. Reclamation costs for prime farmland and alluvial valleys — a computerized analysis. *In* Proceedings, Symposium on Surface Mining Hydrology, Sedimentology and Reclamation. University of Kentucky, College of Engineering, Lexington, University of Kentucky Bulletin 119. p. 123-127.
- Sorensen, Darwin L., Walter A. Kneib, Donald B. Porcella, and Bland Z. Richardson.
1980. Determining the lime requirement for the Blackbird Mine spoil. *Journal of Environmental Quality* 9(1):162-166.
- U.S. Dep. Agric. For. Service.
1979. User guide to engineering, mining and reclamation in the West. U.S. Dep. Agric. For. Serv. General Technical Report INT-70. 58 p.
- U.S. Dep. Agric. Forest Service.
1979. User guide to soils, mining and reclamation in the West. U.S. Dep. Agric. For. Serv. General Technical Report INT-68. 80 p.
- U.S. Dep. Agric. Forest Service.
1979. User guide to vegetation, mining and reclamation in the West. U.S. Dep. Agric. For. Serv. General Technical Report INT-64. 85 p.
- U.S. Dep. Agric. Forest Service.
1980. User guide to hydrology, mining and reclamation in the West. U.S. Dep. Agric. For. Serv. General Technical Report INT-74. 64 p.
- U.S. Dep. Agric. Forest Service.
1980. User guide to sociology and economics, mining and reclamation in the West. U.S. Dep. Agric. For. Serv. General Technical Report INT-73. 53 p.

- Van Kekerix, Lorraine K., Ray W. Brown, and Robert S. Johnston.
1979. Seedling water relations of two grass species on high-elevation acid mine spoils. U.S. Dep. Agric. For. Serv. Research Note INT-262. 17 p.
- Williams, Bryan D., and Paul E. Packer.
1979. Sewage sludge and other organic materials as amendments for revegetation of spent oil shale. *In* Utilization of Municipal Sewage Effluent and Sludge on Forest and Disturbed Land, Chapter 29. Pennsylvania University Press, University Park and London. p. 353-358.
- Willis, Raymond B.
1980. Reduction column for automated determination of nitrate and nitrite in water. *Analytical Chemistry* 52(8):1376-1377.
- Yamamoto, Teruo.
1979. Mixing overburden to simulate soil conditions: AR Company Black Thunder Mine. *In* Ecology and Coal Resource Development, Volume II. Mohan K. Wali, ed. Pergamon Press, New York. p. 791-797.

FIRE AND ATMOSPHERIC SCIENCES

Fire Prevention, Hazard Reduction, and Prescribed Burning

- Bay, Roger R.
1980. Research for fire control in the 80's. *In* Fire Control for the 80's [Symposium Proceedings, Missoula, Mont., October 30-31 and November 1, 1979]. Richard J. Barney, ed. The Intermountain Fire Council and The Fire Working Group, Society of American Foresters. p. 150-157.
- Creelman, Arthur N., James L. Murphy, A. D. Corbin, and others.
1980. Proposed curriculum. U.S. Dep. Agric., Forest Service, Sierra National Forest, Fresno, Calif. 40 p.
- Creelman, Art, J. L. Murphy, Harry R. McClellan, and others.
1980. Report of the fire prevention training development task force. U.S. Dep. Agric., Forest Service, Sierra National Forest, Fresno, Calif. 44 p.
- Dean, Leslie E., and Nancie L. Burchette.
1979. Land use and vegetation mapping of the Cajon Transit Corridor. Earth Sciences Department, University of California, Riverside. 66 p.
- DeBano, L. F., R. M. Rice, and C. E. Conrad.
1980. Chimney Spring forest fire history. U.S. Dep. Agric. For. Serv. Research Paper RM-220. 8 p.
- Dieterich, John H.
1980. Chimney Spring forest fire history. U.S. Dep. Agric. For. Serv. Research Paper RM-220. 8 p.
- Ellis, Richard, and Stewart G. Pickford.
1980. Wildfire data analysis. College of Forest Resources, University of Washington, Seattle. 23 p.
- Hirsch, Stanley N., Gary F. Meyer, and David L. Radloff.
1979. Choosing an activity fuel treatment for southwest ponderosa pine. U.S. Dep. Agric. For. Serv. General Technical Report RM-67. 15 p.
- Latham, Don.
1980. A fire season severity predictor. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 93-95.
- Martin, Robert E., Hal E. Anderson, William D. Boyer, and others.
1979. Effects of fire on fuels: a state-of-knowledge review. U.S. Dep. Agric. For. Serv. General Technical Report WO-13. 64 p.
- Maxwell, Wayne G.
1979. Guidelines for making interdisciplinary determinations of desired residues. U.S. Dep. Agric. For. Serv., Pacific Northwest Region, R-6 Fuels Management Notes, August, 4 p.
- Maxwell, Wayne G., and Franklin R. Ward.
1979. Photo series for quantifying forest residues in the: Sierra mixed conifer type, Sierra true fir type. U.S. Dep. Agric. For. Serv. General Technical Report PNW-95. 79 p.
- Maxwell, Wayne G., and Franklin R. Ward.
1980. Guidelines for developing or supplementing natural photo series. U.S. Dep. Agric. For. Serv. Research Note PNW-358. 16 p.
- Nickey, Bradley B., and Clifford B. Chapman.
1979. Evaluating fire prevention effectiveness through a probability model. *Fire Technology* 15(4):491-506.
- Nissley, Steven D., Robert J. Zasoski, and Robert E. Martin.
1980. Nutrient changes after prescribed surface burning of Oregon ponderosa pine stands. Proceedings, Sixth Conference Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 214-219.
- Radloff, David L.

Fire and Atmospheric Sciences

Sackett, Stephen S.

1979. Natural fuel loadings in ponderosa pine and mixed conifer forests of the Southwest. U.S. Dep. Agric. For. Serv. Research Paper RM-213. 10 p.

Sackett, Stephen S.

1980. An instrument for rapid, accurate, determination of fuel moisture content. *Fire Management Notes*.

Sackett, Stephen S.

1980. Woody fuel particle size and specific gravity of southwestern tree species. U.S. Dep. Agric. For. Serv. Research Note RM-389. 4 p.

See, Thomas E., and James K. Brown.

1980. Down woody fuel accumulations in Northern Region Forests. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 132-136.

Snell, J. A. Kendall.

1979. Preliminary crown weight estimates for tanoak, black oak, and Pacific madrone. U.S. Dep. Agric. For. Serv. Research Note PNW-340. 4 p.

Tiedemann, Arthur R., Carol E. Conrad, John H. Dieterich, and others.

1979. Effects of fire on water: a state-of-knowledge review. U.S. Dep. Agric. - For. Serv. General Technical Report WO-10. 28 p.

Wade, Dale D., and Michael Long.

1979. New legislation aids hazard reduction burning in Florida. *Journal of Forestry* 77:725-726.

Fire Management Methods and Systems

Albini, Frank A., and Carolyn H. Chase.

1980. Fire containment equations for pocket calculators. U.S. Dep. Agric. For. Serv. Research Note INT-268. 17 p.

Andrews, Patricia L.

1980. Testing the fire behavior model. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 70-77.

Barney, Richard J., ed.

1980. Fire control for the 80's [Symposium Proceedings, Missoula, Mont., October 30-31 and November 1, 1979]. The Intermountain Fire Council and The Fire Working Group, Society of American Foresters. 251 p.

Barney, Richard J., and David F. Aldrich.

Bevins, Collin D.

1980. Estimating survival and salvage potential of fire-scarred Douglas-fir. U.S. Dep. Agric. For. Serv. Research Note INT-287. 8 p.

Bevins, Collin D., and Richard J. Barney.

1980. Lightning fire densities and their management implications on Northern Region National Forests. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 127-131.

Bevins, Collin D., and Peter J. Roussopoulos.

1980. National fuels inventory library. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 146-150.

Bradshaw, Larry S., and William C. Fischer.

1980. Computers, climatology, and fire use. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 78-82.

Burgan, Robert E.

1980. A handheld calculator — fire danger and fire behavior. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 65-69.

Chase, Richard A.

1980. FIRESCOPE: a new concept in multiagency fire suppression coordination. U.S. Dep. Agric. For. Serv. General Technical Report PSW-40. 17 p.

Countryman, Clive M., and William A. Dean.

1979. Measuring moisture content in living chaparral: a field user's manual. U.S. Dep. Agric. For. Serv. General Technical Report PSW-36. 28 p.

Egging, Louis T., Richard J. Barney, and Rita P. Thompson.

1980. A conceptual framework for integrating fire considerations in wildland planning. U.S. Dep. Agric. For. Serv. Research Note INT-278. 11 p.

Fischer, William C.

1980. Fire management techniques for the 1980's. *Ames Forester* 1980:23-28.

George, Charles W., G. M. Johnson, and A. D. Blakely.

1979. Airtanker performance guide for Trans-West tank in DC-7 aircraft (Tanker 28-3000-gallon load). Looseleaf insert to U.S. Dep. Agric. For. Serv. General Technical Report INT-27.

George, Charles W., G. M. Johnson, and A. D. Blakely.

1980. Airtanker performance guide — W.A.I.G. DC-4. Looseleaf insert to U.S. Dep. Agric. For. Serv. General Technical Report INT-27.

- Lavdas, L. G.
1980. Aspects of a system for evaluating prescribed fire effects on air quality. Proceedings Second Joint American Meteorological Society/Air Pollution Control Association Conference on Applied Air Pollution Meteorology [New Orleans, La., March 1980]. p. 29-36.
 - Lavdas, L. G.
1980. A vertical velocity model for prescribed fire with smoke management applications. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 285-295.
 - Mills, Thomas J.
1979. Economic evaluation of alternative fire management programs. *In* Fire Control for the 80's [Symposium Proceedings, Missoula, Mont., October 30-31 and November 1, 1979]. The Intermountain Fire Council and The Fire Working Group, Society of American Foresters. p. 75-89.
 - Mills, Thomas J.
1979. Economic evaluation of fire management program alternatives. *In* Annual Meeting Proceedings, Northwest Forest Fire Council, Springfield, Oreg. p. 24.
 - Pierovich, J. M.
1979. Programs and studies to define the impact of point source emissions and prescribed burning on ambient air quality. National Council of Paper Industries for Air and Stream Improvement, Incorporated, Technical Bulletin 103. 16 p.
 - Rothermel, Richard C.
1980. Fire behavior systems for fire management. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 58-64.
 - Roussopoulos, Peter J.
1980. Improving wildland fuel information for wildfire decisionmaking. *In* Proceedings Society of American Foresters 1979. p. 138-142.
 - Roussopoulos, Peter J., Richard F. Yancik, and David L. Radloff.
1980. A national fire occurrence data library for management planning. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 7-12.
 - Simard, A. J.
1979. A computer simulation model of forest fire suppression with air tankers. Canadian Journal of Forest Research 9(3):390-398.
 - Simard, Albert J., Donald A. Haines, and William Main.
1980. Fire management, time and space, and other related matters. *In* Report: National Fire Behavior Research Conference, Chapter D [Boise, Idaho, March 18-20]. U.S. Dep. Agric. For. Serv. p. D1-D13.
 - Wood, Donald B.
1979. Fuel management opportunities on the Lolo National Forest: an economic analysis. U.S. Dep. Agric. For. Serv. Research Note INT-272. 9 p.
- ## Forest Fire Science
- Albini, Frank A.
1980. Thermochemical properties of flame gases from fine wildland fuels. U.S. Dep. Agric. For. Serv. Research Paper INT-243. 42 p.
 - Barney, Richard J.
1979. Wildland fire research needs in the West: Forest Service managers' views. U.S. Dep. Agric. For. Serv. General Technical Report INT-63. 15 p.
 - Benner, W. Henry, and Paul Urone.
1980. Photochemical gas-to-particle conversion in filtered combustion gases. Presented at the 73rd Annual Meeting, Air Pollution Control Association [Montreal, Canada, June 22-27]. Paper 80-50.3. 14 p.
 - Brown, James K.
1980. Influence of harvesting and residues on fuels and fire management. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 417-432.
 - Carlson, J. N., and L. W. Gay.
1980. The energy budget of a fuel moisture stick. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 246-255.
 - Chi, C. T., D. A. Horn, R. B. Reznik, and others.
1979. Source assessment: prescribed burning, state of the art. U.S. Environmental Protection Agency, EPA 600/2-79-019h. 107 p.
 - Clements, Hubert B., and Charles K. McMahon.
1980. Nitrogen oxides from burning forest fuels examined by thermogravimetry and evolved gas analysis. *Thermochimica Acta* 35:133-139.
 - Fischer, William C.

Frandsen, W. H., and L. Bradshaw.

1980. Estimating duff moisture from meteorological measurements. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 96-101.

Johnson, Von J.

1979. Northcentral and Northeastern U.S. *In* Effects of fire on fuels. U.S. Dep. Agric. For. Serv. General Technical Report WO-13. p. 5-7.

Latham, Don J.

1980. Simple noise level digitizer. Review of Scientific Instruments 51(1):148-149.

Loomis, Robert M., Peter J. Roussopoulos, and Richard W. Blank.

1979. Summer moisture contents of understory vegetation in northeastern Minnesota. U.S. Dep. Agric. For. Serv. Research Paper NC-179. 7 p.

McMahon, Charles K., Dale D. Wade, and Skevos N. Tsoukalas.

1980. Combustion characteristics and emissions from burning organic soils. Presented at the 73rd Annual Meeting of Air Pollution Control Association [Montreal, Canada, June 22-27]. Paper 80-15.5. 19 p.

Nelson, Ralph M., Jr., and Darold E. Ward.

1980. Backfire particulate emissions and Byram's fire intensity. U.S. Dep. Agric. For. Serv. Research Note SE-290. 6 p.

Norum, Rodney A., and William C. Fischer.

1980. Determining the moisture content of some dead forest fuels using a microwave oven. U.S. Dep. Agric. For. Serv. Research Note INT-277. 7 p.

Olson, Craig M.

1980. An evaluation of the Keetch-Byram Drought Index as a predictor of foliar moisture. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 241-245.

Philpot, C. W.

1979. Fire dynamics in chaparral. Cal-Neva Wildlife Transactions 1979:102-103.

Roussopoulos, Peter J., and Robert M. Loomis.

1979. Weights and dimensional properties of shrubs and small trees of the Great Lakes conifer forest. U.S. Dep. Agric. For. Serv. Research Paper NC-178. 6 p.

Susott, Ronald A.

1980. Effect of heating rate on char yield from forest fuels. U.S. Dep. Agric. For. Serv. Research Note INT-295. 9 p.

Ward, Darold E., Hubert B. Clements, and Ralph M. Nelson, Jr.

1980. Particulate matter emission factor modeling for fires in southeastern fuels. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 276-284.

Wilson, Ralph.

1980. Reformulation of forest fire spread equations in SI units. U.S. Dep. Agric. For. Serv. Research Note INT-292. 5 p.

Ecological Relations

Arno, Stephen F.

1980. Forest fire history in the Northern Rockies. Journal of Forestry 8:460-465.

Barrett, Stephen W.

1980. Indians and fire. Western Wildlands 6(3):17-21.

Bartos, Dale L., and Walter F. Mueggler.

1979. Influence of fire on vegetation production in the aspen ecosystem in western Wyoming. *In* North American elk: ecology, behavior and management. Mark S. Boyce and Larry D. Hayden-Wing, eds. University of Wyoming, Laramie. p. 75-78.

Davis, Kathleen M., Bruce D. Clayton, and William C. Fischer.

1980. Fire ecology of Lolo National Forest habitat types. U.S. Dep. Agric. For. Serv. General Technical Report INT-79. 77 p.

DeBano, Leonard F., Raymond M. Rice, and C. Eugene Conrad.

1979. Soil heating in chaparral fires: effects on soil properties, plant nutrients, erosion, and runoff. U.S. Dep. Agric. For. Serv. Research Paper PSW-145. 21 p.

DeByle, Norbert V.

1980. Harvesting and site treatment influences on the nutrient status of lodgepole pine forests in western Wyoming. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 137-156.

Dunn, Paul H., and Mark Poth.

1979. Nitrogen replacement after fire in chaparral. *In* Symbiotic Nitrogen Fixation in the Management of Temperate Forest, Proceedings Workshop [April 2-5, 1979, Corvallis, Oreg.]. Oregon State University, Corvallis. p. 287-293.

Geiszler, Daniel R., and Robert I. Gara.

1978. Mountain pine beetle attack dynamics in lodgepole pine. *In* Theory and practice of mountain pine beetle management in lodgepole pine forests. University of Idaho, Moscow. p. 182-187.

Gruell, George E.

1979. Wildlife habitat investigations and management implications on the Bridger-Teton National Forest. *In* North American elk: ecology, behavior and management. Mark S. Boyce and Larry D. Hayden-Wing, eds. University of Wyoming, Laramie. p. 63-74.

Gruell, George E.

1980. Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming. Volume I — Photographic record and analysis. U.S. Dep. Agric. For. Serv. Research Paper INT-235. 207 p.

Gruell, George E.

1980. Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming. Volume II — Changes and causes, management implications. U.S. Dep. Agric. For. Serv. Research Paper INT-252. 35 p.

Hart, George E., Norbert V. DeByle, and Robert W. Hennes.

1980. Soil solution chemistry and slash disposal. *In* Symposium on Watershed Management 1980. American Society of Civil Engineers, New York. p. 318-325.

Harvey, A. E., M. F. Jurgensen, and M. J. Larsen.

1979. Role of forest fuels in the biology and management of soil. U.S. Dep. Agric. For. Serv. General Technical Report INT-65. 8 p.

Henderson, G. S., W. T. Swank, and J. W. Hornbeck.

1980. Impact of sulfur deposition on the quality of water from forested watersheds. *In* Atmospheric Sulfur Deposition: Environmental Impacts and Health Effects. D. F. Shriner, E. R. Richmond, and F. E. Linberg, eds. Ann Arbor Sciences, Incorporated. p. 431-442.

Johnson, D. W., J. W. Hornbeck, J. M. Kelly, and others.

1980. Regional patterns of soil sulfate accumulation: relevance to ecosystem sulfur budgets. *In* Atmospheric Sulfur Deposition: Environmental Impacts and Health Effects. D. F. Shriner, E. R. Richmond, and F. E. Linberg, eds. Ann Arbor Sciences, Incorporated. p. 507-520.

Keay, Jeffrey A., and James M. Peek.

1980. Relationships between fires and winter habitat of deer in Idaho. *Journal of Wildlife Management* 44(2):372-380.

Landsberg, J. D., and P. H. Cochran.

1980. Prescribed burning effects on foliar nitrogen content in ponderosa pine. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 209-213.

Lewis, William M., Jr., and Michael C. Grant.

1980. Acid precipitation in the western United States. *Science* 207:176-177. (Eisenhower Consortium Journal Series Paper 29.)

Lyon, L. J., H. S. Crawford, E. Czuhai, and others.

1978. Effects of fire on fauna — a state-of-knowledge review. U.S. Dep. Agric. For. Serv. General Technical Report WO-6. 41 p.

Martin, Robert E.

1978. Are silvicultural and fuel management objectives compatible? *In* R-6 Silviculture Workshop [October 1978, Colville National Forest]. U.S. Dep. Agric. For. Serv., Colville National Forest, Colville, Wash. p. 80-95.

Mitchell, R. G., and Robert E. Martin.

1980. Fire and insects in western pine culture in the Pacific Northwest. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 182-190.

Mroz, G. D., M. F. Jurgensen, A. E. Harvey, and M. J. Larsen.

1980. Effects of fire on nitrogen in forest floor horizons. *Soil Science Society of American Journalists* 44:395-400.

Noste, N. V., R. J. Barney, and K. P. Burnham.

1979. Effects of burning on forest floor characteristics. *In* Ecological Effects of the Wickersham Dome Fire near Fairbanks, Alaska. U.S. Dep. Agric. For. Serv. General Technical Report PNW-90. p. 10-11.

Noste, N. V., R. J. Barney, and C. T. Dyrness.

1979. Mineral soil characteristics following burning. *In* Ecological Effects of the Wickersham Dome Fire near Fairbanks, Alaska. U.S. Dep. Agric. For. Serv. General Technical Report PNW-90. p. 12-14.

Odening, W. R., and B. R. Strain.

1979. Nonpositive turgor potential and growth in *Larrea*. *In* Larrea. E. C. Lopez, T. J. Mabry, and S. F. Cabizon, eds. Centro de Investigacion en Quimica Aplicada, Caltillo, Coahuila, Mexico. p. 151-163.

Oechel, Walter C., and William T. Lawrence.

1979. Energy utilization and carbon metabolism in Mediterranean scrub vegetation of Chile and California. I. Methods: a transportable cuvette field photosynthesis and data acquisition system and representative results for *Ceanothus greggii*. *Oecologia* 39:321-335.

Oechel, Walter C., and Jamil Mustafa.

1979. Energy utilization and carbon metabolism in Mediterranean scrub vegetation of Chile and California. II. The relationship between photosynthesis and cover in chaparral evergreen shrubs. *Oecologia* 41:305-315.

Perry, David L., and James E. Lotan.

1979. A model of fire selection for serotiny in lodgepole pine. *Evolution* 33(3):958-968.

Fire and Atmospheric Sciences

- Potter, Meredith W., and Stephen R. Kessell.
1980. Predicting mosaics and wildlife diversity resulting from fire disturbance to a forest ecosystem. *Environmental Management* 4(3):247-254.
- Quinn, Ronald D.
1979. Effects of fire on small mammals in the chaparral. *Cal-Neva Wildlife Transactions* 1979:125-133.
- Simovich, Marie A.
1979. Post fire reptile succession. *Cal-Neva Wildlife Transactions* 1979:104-113.
- Viereck, L. A., and C. T. Dyrness, technical editors.
1979. Ecological effects of the Wickersham Dome fire near Fairbanks, Alaska. U.S. Dep. Agric. For. Serv. General Technical Report PNW-90. 71 p.
- Viereck, L. A., Joan Foote, C. T. Dyrness, and others.
1979. Preliminary results of experimental fires in the black spruce type of interior Alaska. U.S. Dep. Agric. For. Serv. Research Note PNW-332. 27 p.
- Wade, Dale D., John Ewel, and Ronald Hofstetter.
1980. Fire in south Florida ecosystems. U.S. Dep. Agric. For. Serv. General Technical Report SE-17. 125 p.
- Williams, Jerry T., Robert E. Martin, and Stewart G. Pickford.
1980. Silvicultural and fire management implications from a timber type evaluation of tussock moth outbreak areas. *In Proceedings, Sixth Conference on Fire and Forest Meteorology* [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 191-196.
- Wirtz, William O., II.
1979. Effects of fire on birds in chaparral. *Cal-Neva Wildlife Transactions* 1979:114-124.
- Woodard, P. M., and R. E. Martin.
1980. Duff weight and depth in a high elevation *Pinus contorta* Douglas forest. *Canadian Journal of Forest Research* 10:7-9.
- Wright, Henry A., Leon F. Neuenschwander, and Carlton M. Britton.
1979. The role and use of fire in sagebrush-grass and pinyon-juniper plant communities: a state-of-the-art review. U.S. Dep. Agric. For. Serv. General Technical Report INT-58. 48 p.
- Wright, Henry A.
1980. The role and use of fire in the semidesert grass-shrub type. U.S. Dep. Agric. For. Serv. General Technical Report INT-85. 24 p.
- Wright, Henry A., and Arthur W. Bailey.

Weather Modification and Weather Effects

- Baughman, R. G., and F. A. Albini.
1980. Estimating midflame windspeeds. *In Proceedings, Sixth Conference on Fire and Forest Meteorology* [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 88-92.
- Driver, B. L., Donald Rosenthal, and Lynn Johnson.
1979. A suggested research approach for quantifying the psychological benefits of air visibility. *In Proceedings Workshop in Visibility Values* [January 28-February 1, 1979, Fort Collins, Colo.]. Douglas Fox, Ross J. Loomis, and Thomas C. Green, technical coordinators. U.S. Dep. Agric. For. Serv. General Technical Report WO-18. p. 100-105.
- Fosberg, Michael A.
1979. Meteorological services and data use in renewable natural resources management. *In Proceedings National Weather Service Agricultural Meteorology Training Conference* [Davis, Calif., September 10-14, 1979]. p. 125-159.
- Fosberg, Michael A., Charles D. Craig, and Marshall P. Waters, III.
1980. Applications of infrared data from a geosynchronous meteorological satellite in surface wind modeling. *In Proceedings, Sixth Conference on Fire and Forest Meteorology* [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 265-275.
- Fox, Douglas G., program chairman.
1980. *Proceedings of the Second Joint Conference on Applications of Air Pollution Meteorology* [March 24-28, 1980, New Orleans, La.]. American Meteorology Society, Boston, Mass. 870 p.
- Greenland, David E.
1979. Modeling air pollution potential for mountain resorts. Institute of Arctic and Alpine Research, University of Colorado, Boulder. Occasional Paper 32. 96 p. (Eisenhower Consortium Journal Series Paper 41)
- Greenland, David.
1980. The use of modeled mixing height data with the box model applied to mountain valleys. *In Second Joint Conference on Applications of Air Pollution Meteorology and Industrial Meteorology* [March 24-28, 1980, New Orleans, La.]. American Meteorology Society, Boston, Mass. p. 510-514.
- Fuquay, Donald M.
1980. Forecasting lightning activity level and associated weather. U.S. Dep. Agric. For. Serv. Research Paper INT-244. 30 p.

- Haines, Donald, John Frost, and Rosalie Klumpp.
1980. A portable instrument to test field anemometers. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 124-126.
- Houghton, John G.
1980. A model for orographic precipitation in the north-central Great Basin. *Monthly Weather Review* 107:1462-1475.
- Johnson, Von J.
1979. The Lake States 1976 fire season. *In* Proceedings Fire Management in the Northern Environment. Bureau of Land Management/State of Alaska. National Technical Information Service, Springfield, Va. p. 79-88.
- Kramer, Bruce M.
1979. Air quality modeling: judicial, legislative and administrative reactions. *Columbia Journal of Environmental Law* 5(2):236-264. (Eisenhower Consortium Journal Series Paper)
- Kramer, Bruce R., and D. G. Fox.
1980. Air quality modeling: judicial, legislative and administrative reactions. *In* Second Joint Conference on Applications of Air Pollution Meteorology and Industrial Meteorology [March 24-28, 1980, New Orleans, La.]. American Meteorology Society, Boston, Mass. p. 683-686.
- Langham, Lucy.
1980. Wintertime dispersion processes in the Lake Tahoe Basin. *In* Second Joint Conference on Applications of Air Pollution Meteorology and Industrial Meteorology [March 24-28, 1980, New Orleans, La.]. American Meteorology Society, Boston, Mass. p. 520-525.
- Latham, Don J.
1979. Progress toward locating lightning fires. U.S. Dep. Agric. For. Serv. Research Note INT-269. 6 p.
- McCutchan, Morris H.
1979. Determining the diurnal variation of surface temperature in mountainous terrain. *Applied Meteorology* 18(9):1224-1239.
- McCutchan, Morris H.
1980. Use of cluster analysis and discriminant analysis to classify synoptic weather types in southern California. *Proceedings 8th Conference on Weather Forecasting and Analysis* [June 10-13, 1980, Denver, Colo.]. p. 310-315.
- McCutchan, Morris H., and R. William Furman.
1979. Collection and storage of meteorological data by the Forest Service. *Proceedings Workshop on Wind Climate* [Asheville, N.C., November 1979]. p. 91-98.

- McNab, W. Henry, Ragner W. Johansen, and William B. Flanner.
1979. Cold winter and spring extended fire season in the pocosins. U.S. Dep. Agric. For. Serv. Fire Management Notes 40:11-12.
- Sommers, William T.
1980. Observations of waves on a marine inversion intersecting the southern California coastal mountains. *In* Preprints, Second Conference on Coastal Meteorology [American Meteorology Society, January 30-February 1, 1980, Los Angeles, Calif.]. p. 161-167.
- Taylor, Bernadine, and William Waite.
1980. Interpolating climatological data for rugged terrain: some analytical techniques. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 163-173.
- Wade, Dale D.
1980. An attempt to correlate smoke from Everglades fires with urban south Florida air quality. *In* Proceedings, Sixth Conference on Fire and Forest Meteorology [Seattle, Wash., April 22-24]. Society of American Foresters, Washington, D.C. p. 156-162.

INSECTS AND DISEASE

Insect Detection and Evaluation

- Alvarez, Isabel F., David L. Rowney, and Fields W. Cobb, Jr.
1979. Mycorrhizae and growth of white fir seedlings in mineral soil with and without organic layers in a California forest. *Canadian Journal of Forest Research* 9:311-315.
- Antibus, R. K., J. M. Trappe, and A. E. Linkins.
1980. Cyanide resistant respiration in *Salix nigra* endomycorrhizae. *Canadian Journal of Botany* 58:14-20.
- Carolyn, V. M., and David McComb.
1979. Sampling and evaluation methods for defoliators, chapter 5. *In* Forest Insect Survey and Control, 4th ed. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 63-76.
- Daniels, B. A., and J. M. Trappe.
1980. Factors affecting spore germination of the vesicular-arbuscular mycorrhizal fungus, *Glomus epigaeus*. *Mycologia* 72(3):457-471.
- Daterman, G. E., R. L. Livingston, J. M. Wenz, and L. L. Sower.
1979. How to use pheromone traps to determine outbreak potential. U.S. Dep. Agric. Agricultural Handbook 546. 11 p.

Insects and Disease

Daterman, Gary E.

1978. Monitoring and early detection. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 5.3. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 99-102.

DeMars, C. J.

1980. Managing tree mortality location data with a desk-top minicomputer. *In* Proceedings of Remote Sensing for Natural Resources, an International View of Problems, Promises and Accomplishments [September 10-14, 1979, Moscow, Idaho]. p. 69-77.

DeMars, C. J., F. P. Hain, and G. W. Slaughter.

1979. Distribution and abundance of photo-detected tree mortality over time. *In* Evaluating Control Tactics for the Southern Pine Beetle, Symposium Proceedings [January 30-February 1, 1979, Many, La.]. U.S. Dep. Agric. Technical Bulletin 1613. p. 63-74.

DeMars, C. J., G. W. Slaughter, W. D. Bedard, and others.

1980. Estimating western pine beetle-caused tree mortality for evaluating an attractive pheromone treatment. *Journal of Chemical Ecology* 6(5):853-866.

Dewey, Jerald E., and Robert W. Campbell.

1978. Outbreak detection, projection, and evaluation. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 12.1. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 233-235.

Dimond, J. B., and C. J. Spies, III.

1980. A comparison of *B.t.* alone with *B.t.* plus the additives Chitinase and Orthene® in control of eastern spruce budworm. Life Science-Agriculture State, University of Maine at Orono. Miscellaneous Report 224. 15 p.

Dix, Mary Ellen.

1979. Insects — identification and importance. *In* Windbreak Management, Proceedings Workshop [Norfolk, Nebr., October 23-25, 1979]. Great Plains Agricultural Council Publication 92. p. 19-48.

Dunn, G. A., and R. M. Reeves.

1980. A modified collection net for catching insects under cloth bands on trees. *Entomological News* 91(1):7-9.

Dwinell, L. David, and Harry O. Yates, III.

1979. Potential entomological and pathological problems of forest tree crops grown under intensive culture. A report to the Environmental Sciences Division of the Oak Ridge National Laboratory. 90 p.

Esenther, G. R.

1980. Estimating the size of subterranean termite colonies by a release-recapture technique. International Research Group Document Number IRG/WP/112. 5 p.

Etter, D. O., W. E. Wallner, and D. R. Houston.

1980. Integrated protection of oak forests with emphasis on gypsy moth and oak wilt. *In* Proceedings International Congress on Plant Protection [Washington D.C., August 1979].

Fedde, G. F.

1980. Spring parasitism of fall cankerworm eggs in northern Georgia by *Telenomus alsophilae* (Hymenoptera: Scelionidae). *Journal of the Georgia Entomological Society* 15:199-206.

Fogel, Robert, and Gary Hunt.

1979. Fungal and arboreal biomass in a western Oregon Douglas-fir ecosystem: distribution patterns and turnover. *Canadian Journal of Forest Research* 9(2):245-256.

Furniss, Malcolm M., Bruce H. Baker, Richard A. Werner, and Larry C. Yarger.

1979. Characteristics of spruce beetle (Coleoptera) infestation in felled white spruce in Alaska. *Canadian Entomologist* 111:1355-1360.

Hain, F. P., J. A. Richmond, and H. A. Thomas.

1979. Predicting spring emergence of the Nantucket pine tip moth by degree-day cumulation. *In* Proceedings: Flowering and Seed Development in Trees: A Symposium. Frank Bonner, ed. [Sponsored by Southern Forest Experiment Station, U.S. Dep. Agric. For. Serv.; Mississippi State University, Department of Forestry; and International Union Forest Research Organization]. p. 342-346.

Hedlin, Alan F., Harry O. Yates, III, David Cibrián Tovar, and others.

1980. Cone and seed insects of North American conifers. *Canadian Forest Service, Ottawa, Can.* 122 p.

Ho, Iwan.

1979. Acid phosphatase activity in forest soil. *Forest Science* 25(4):567-568.

Ho, Iwan, and James M. Trappe.

1980. Nitrate reductase activity of nonmycorrhizal Douglas-fir rootlets and of some associated mycorrhizal fungi. *Plant and Soil* 54:395-398.

Ho, Iwan, and Bratislav Zak.

1979. Acid phosphatase activity of six ectomycorrhizal fungi. *Canadian Journal of Botany* 57(11):1203-1205.

Jennings, Daniel T., and Milton J. Stelzer.

- Largent, David L., Neil Sugihara, and Ann Brinitzer.
1980. *Amanita gemmata*, a non-host-specific mycorrhizal fungus of *Arctostaphylos manzanita*. Mycologia 72(2):435-439.
- Long, Garrell E., and Leon J. Theroux.
1979. Sampling and distributions of larch casebearer, *Coleophora laricella*, on western larch. Environmental Entomology 8(4):643-648.
- McKeague, Marcia A., and Gary A. Simmons.
1979. Terminal bud damage on black walnut by casebearer moths and late spring frost. Michigan State University, Cooperative Experiment Service, Extension Bulletin E-1321. 3 p.
- Mason, Richard R.
1978. Evaluation of population potential. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 5.4. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 102-105.
- Mason, Richard R.
1978. Introduction. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 3.1. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 39.
- Mason, Richard R.
1979. How to sample Douglas-fir tussock moth larvae. U.S. Dep. Agric. Agricultural Handbook 547. 15 p.
- Mason, Richard R., and Robert F. Luck.
1978. Population growth and regulation. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 3.2.3. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 41-47.
- Mason, Richard R., and Robert F. Luck.
1978. Quantitative expression and distribution of populations. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 3.2.1. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 39-41.
- Mason, Richard R., and Torolf R. Torgersen.
1978. Action guidelines. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 5.6. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 108.
- Miller, William E.
1979. Identificatory corrections for two North American *Apotomis* moths (Tortricidae: Olethreutinae). Great Lakes Entomologist 12(3):115-118.
- Molina, Randy.
1979. Pure culture synthesis and host specificity of red alder mycorrhizae. Canadian Journal of Botany 57(11):1223-1228.
- Paul, H. Gene.
1979. How to construct larval sampling equipment. U.S. Dep. Agric., Agricultural Handbook 545. 11 p.
- Richmond, James A., and C. Wayne Berisford.
1980. Comparison of attraction of pheromone extracts from diet-reared and wild *Rhyacionia frustrana* females to wild males. Journal of the Georgia Entomological Society 15:258-260.
- Rose, Sharon L., and James M. Trappe.
1980. Three new endomycorrhizal *Glomus* spp. associated with actinorrhizal shrubs. Mycotaxon 10(2):413-420.
- Sartwell, C., G. E. Daterman, T. W. Koerber, and others.
1980. Distribution and hosts of *Eucosma sonomana* in the western United States as determined by trapping with synthetic sex attractants. Annals of the Entomological Society of America 73(3):254-256.
- Schreuder, Hans T., William H. Clark, Patrick J. Barry, and David M. Holland.
1980. Two-state stratified sampling with regression to assess southern pine beetle damage. U.S. Dep. Agric. For. Serv. Research Paper SE-212. 6 p.
- Torgersen, Torolf R.
1978. Biological evaluations. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 5.5. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 105-108.
- Trappe, James M.
1979. *Glomus segmentatus* sp. nov. Transactions British Mycological Society 73(2):362-363.
- Trappe, James M.
1979. Mycorrhiza-nodule-host interrelationships in symbiotic nitrogen fixation: a quest in need of questions. In Symbiotic Nitrogen Fixation in the Management of Temperate Forests, Proceedings Forest Research Laboratory, Oregon State University, Corvallis. p. 276-286.
- Trappe, James M., and Walter B. Bollen.
1979. Forest soil biology. In Forest Soils of the Douglas-fir Region, Chapter 8. Washington State University Cooperative Extension, Pullman. p. 145-155.
- Trappe, James M., Gaston Guzman, and Carlos Vazquez-Salinas.
1979. Observaciones sobre la identificacion, distribucion y usos de los

Van Deusen, James L., and Mary Ellen Dix.

1980. A survey of *Petrova metallica* (Busck) in a South Dakota ponderosa provenance test plantation (Lepidoptera: Tortricidae: Olethreutinae). *Journal of the Kansas Entomological Society* 53(3):662-668.

Wickman, Boyd E.

1978. Introduction. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 4.1. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 63-64.

Wickman, Boyd E.

1978. Tree injury. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 4.3. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 66-77.

Wickman, B. E.

1979. How to estimate defoliation and predict tree damage. U.S. Dep. Agric., *Agricultural Handbook* 550. 15 p.

Wickman, Boyd E.

1980. Increased growth of white fir after a Douglas-fir tussock moth outbreak. *Journal of Forestry* 78(1):31-33.

Williams, Isadore L., and Carl W. Fatzinger.

1980. Duration of the larval, pupal, and moth stages of the southern pine coneworm *Dioryctria amatella* (Hulst). U.S. Dep. Agric. For. Serv. Research Note SE-295. 4 p.

Wilson, S. W., and J. E. McPherson.

1979. A preliminary report on the bionomics of fulgoroidea on black walnut with emphasis on *Anormenis septentrionalis* (Spinola) (Homoptera). *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 29-34.

Wilson, S. W., and J. E. McPherson.

1979. Notes on the occurrence of *Epipyrops barberiana* in southern Illinois (Lepidoptera: Epipyropidae). *Great Lakes Entomologist* 12(4):189-190.

Wilson, S. W., and J. E. McPherson.

1979. The first record of *Megamelus palaetus* in Illinois (Homoptera: Fulgoroidea: Delphacidae). *Great Lakes Entomologist* 12(4):227.

Wilson, S. W., and J. E. McPherson.

1979. The first report of the occurrence of *Oecleus chrisjohni* and *O. epetrior* in Illinois (Homoptera: Fulgoroidea: Cixiidae). *Great Lakes Entomologist* 12(4):227-228.

Wilson, S. W., and J. E. McPherson.

1980. A list of the Fulgoroidea (Homoptera) of southern Illinois. *Great Lakes Entomologist* 13(1):25-30.

Worley, David P.

1980. Detecting insect and disease problems in urban forest. *Proceedings National Urban Forest Conference*. State University of New York, College of Environmental Sciences, Syracuse, ESF Publication 80-003. p. 802-808.

Insect Biology

Amman, Gene D.

1980. Mountain pine beetle dynamics in lodgepole pine forests and strategies for reducing tree losses. *In* Forest Insect Pest Research and Control Practice. *Proceedings International Congress on Entomology, After-Congress Meeting*. Fujio Kobayashi and Kazumasa Katagiri, eds. Forest Products Research Institute, Tsukuba, Japan. p. 1-6.

Armstrong, J. E., W. H. Kearby, and A. E. McGinnes, Jr.

1979. Anatomical response and recovery of twigs of *Juglans nigra* following oviposition injury inflicted by the two-spotted treehopper, *Enchenopa binotata*. *Wood and Fiber* 11(1):29-37.

Armstrong, J. E., and E. A. McGinnes, Jr.

1979. Wound reactions in twigs of black walnut. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 83-87.

Beckwith, Roy C.

1978. Description of life stages. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 2.2. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 26-30.

Beckwith, Roy C.

1978. Foliage damage. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 4.2. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 64-66.

Beckwith, Roy C.

1978. Introduction. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 2.1. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 25-26.

Blair, L. M., W. R. Enns, and W. H. Kearby.

1980. The morphology of the larva of *Conotrachelus retentus*, the black walnut curculio (Coleoptera: Curculionidae). *Journal of the Kansas Entomological Society* 53(2):325-332.

Blair, Larry M., and William H. Kearby.

1979. The black walnut curculio and its impact on nut production. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 51-54.

- Bridges, John R., and Faye H. Guinn.
1980. A solid injection technique for studying bark beetle pheromones. *Zeitschrift für Angewandte Entomologie* 89:45-47.
- Carolin, V. M.
1980. Larval densities and trends of insect species associated with spruce budworms in buds and shoots in Oregon and Washington. U.S. Dep. Agric. For. Serv. Research Paper PNW-273. 18 p.
- Cokendolpher, James C., Norman V. Horner, and Daniel T. Jennings.
1979. Crab spiders of North-Central Texas (Araneae: Philodromidae and Thomisidae). *Journal of the Kansas Entomological Society* 52(4):723-734.
- Dickerson, W. A., J. D. Hoffman, E. G. King, and others.
1980. Arthropod species in culture in the United States and other countries. Entomological Society of America.
- Drooz, A. T.
1980. A review of the biology of the elm spanworm (Lepidoptera: Geometridae). *Great Lakes Entomologist* 13(1):49-53.
- Farris, M. E., and J. E. Appleby.
1979. The walnut caterpillar, *Datana integerrima* G. & R. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 22-28.
- Fellin, David G.
1980. A review of some relationships of harvesting, residue management, and fire to forest insects and disease. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 335-416.
- Fellin, David G.
1980. Effect of silvicultural practices, residue utilization and prescribed fire on some forest floor arthropods. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 287-316.
- Fellin, David G.
1980. Populations of some forest litter, humus, and soil arthropods as affected by silvicultural practices, residue utilization, and prescribed fire. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 317-334.
- Galford, Jimmy R.
1980. Bait bucket trapping for red oak borers (Coleoptera: Cerambycidae). U.S. Dep. Agric. For. Serv. Research Note NE-293. 2 p.
- Galford, Jimmy R.
1980. Use of a pheromone to cause copulation between two species of cerambycids. U.S. Dep. Agric. For. Serv. Research Note NE-289. 2 p.
- Hain, F. P., C. J. DeMars, W. T. McClelland, and W. D. Mawby.
1979. Relating tree mortality to collapsing beetle population. *In* Evaluating Control Tactics for the Southern Pine Beetle, Symposium Proceedings [January 30-February 1, 1979, Many, La.]. U.S. Dep. Agric. Technical Bulletin 1613. p. 54-62.
- Hunter, Malcolm, Susanne C. Hacker, Daniel T. Jennings, and Fred B. Knight.
1979. Spruce budworms thesaurus. Canada/United States Spruce Budworms Program and Maine Life Sciences and Agriculture Experiment Station, Miscellaneous Report 220. 41 p.
- Kearby, William H.
1979. The life history of *Acrobasis demotella* and its role in seedling and sapling stem deformities in Missouri. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 55-57.
- Kline, LeRoy N., and Russel G. Mitchell.
1979. Insects affecting twigs, terminals, and buds, chapter 13. *In* Forest Insect Survey and Control, 4th edition. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 215-226.
- Kuhlman, George E.
1980. Hypovirulence and hyperparasitism. *In* Plant Disease: An Advanced Treatise, Volume 5. J. G. Horsfall and Ellis B. Cowling, eds. Academic Press, New York. p. 363-380.
- Kuntz, J. E., A. J. Prey, S. Jutte, and V. M. G. Nair.
1979. The etiology, distribution, epidemiology, histology and impact of butternut canker in Wisconsin. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 69-72.
- Liang, M. Y., H. C. Coppell, F. Matsumura, and G. Esenther.
1979. Exocuticular structures on the sternal gland segments of *Rhinotermitidae*. *Sociobiology* 4(2):169-190.
- Lorimer, Nancy.
1979. Differential hatching times in the forest tent caterpillar (Lepidoptera: Lasiocampidae). *Great Lakes Entomologist* 12(4):199-201.
- Lorimer, Nancy.
1979. Genetic causes of pest population outbreaks and crashes. *In* Genetics in Relation to Insect Management. Working papers — The Rockefeller Foundation. p. 50-54.

- Lorimer, Nancy, and William J. Mattson, Jr.
1979. Prediapause hatching of the forest tent caterpillar in the laboratory. *Great Lakes Entomologist* 12:119-121.
- Martinat, P., and W. E. Wallner.
1980. Biology of *Acrobasis* species and notes on damage to black walnut. *Great Lakes Entomologist* 13(1):41-48.
- Martinat, Peter J., and William E. Wallner.
1980. Notes on the biology and damage of two acrobasis species (Lepidoptera: Pyralidae) on black walnut in Michigan. *Great Lakes Entomologist* 13(1):41-48.
- Martinat, Peter J., and Louis F. Wilson.
1979. The life histories of *Acrobasis juglandis* and *A. demotella* on black walnut in Michigan. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 40-43.
- Mazzone, H. M., G. Wray, W. F. Engler and G. F. Bahr.
1980. High voltage electron microscopy of cells in culture and viruses. *In* Invertebrate Systems in vitro. E. Kurstak, K. Maramorsch and A. Dubendorfer, eds. Elsevier/North-Holland Biomedical Press, Amsterdam. p. 511-515.
- McCambridge, William F.
1980. Some mountain pine beetle infestation characteristics in dwarf mistletoe-infected and uninfected ponderosa pine. U.S. Dep. Agric. For. Serv. Research Note RM-391. 2 p.
- McCambridge, William F., Gene D. Amman, and Galen C. Trostle.
1979. Mountain pine beetle. U.S. Dep. Agric. For. Serv. Forest Insect and Disease Leaflet 2. 7 p. (revision)
- Miller, Mitchel C.
1979. Development of a specific anti-adult southern pine beetle serum. *Annals of the Entomological Society of America, Miscellaneous Publication* 11(4):35-53.
- Miller, Mitchel C.
1979. Preparatory immunodiffusion for production of specific anti-adult southern pine beetle serum. *Annals of the Entomological Society of America* 72(6):820-825.
- Mitchell, R. G.
1979. Sucking insects, chapter 14. *In* Forest Insect Survey and Control, 4th edition. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 227-243.
- Mog, T. P., and J. A. Witter.
1979. Field techniques for assessing the impact of the spruce budworm (Lepidoptera: Tortricidae) in Michigan's Upper Peninsula. *The Great Lakes Editor* 12(4):213-218.
- Molina, Randy.
1979. Ectomycorrhizal inoculation of containerized Douglas-fir and lodgepole pine seedlings with six isolates of *Pisolithus tinctorius*. *Forest Science* 25(4):585-590.
- Molina, Randy.
1980. Ectomycorrhizal inoculation of containerized western conifer seedlings. U.S. Dep. Agric. For. Serv. Research Note PNW-357. 12 p.
- Namkoong, Gene.
1980. Population genetic dynamics of forest insects. *In* Population Dynamics of Forest Insects at Low Levels. Fred Hain, ed. North Carolina State University Graphics, Raleigh. p. 6-8.
- Odell, T. M., and P. A. Godwin.
1979. Laboratory technique for rearing *Blepharipa pratensis*, a tachinid parasite of gypsy moth. *Annals of the Entomological Society of America* 72:632-635.
- Powell, Jerry A.
1980. Nomenclature of nearctic conifer-feeding *Choristoneura* (Lepidoptera: Tortricidae): Historical review and present status. U.S. Dep. Agric. For. Serv. General Technical Report PNW-100. 18 p.
- Rasmussen, Lynn A.
1980. Emergence and attack behavior of the mountain pine beetle in lodgepole pine. U.S. Dep. Agric. For. Serv. Research Note INT-297. 7 p.
- Rexrode, Charles O., and John E. Baumgras.
1980. Gum spots caused by cambium miners in black cherry in West Virginia. U.S. Dep. Agric. For. Serv. Research Paper NE-463. 9 p.
- Robertson, Jacqueline L.
1979. Rearing the western spruce budworm. Canada/United States Spruce Budworms Program, U.S. Dep. Agric. For. Serv., Washington, D.C. 18 p.
- Solomon, J. D.
1979. Trapping and biology of *Podosesia* and *Paranthrene* borers. *Proceedings Symposium Pheromones of the Sesiidae, 1978 Annals of the Entomological Society of America Meeting*. p. 47-54.
- Stevens, Robert E., J. Wayne Brewer, and David Leatherman.
1980. Insects affecting ponderosa pine in Colorado. U.S. Dep. Agric. For. Serv. General Technical Report RM-75. 42 p.
- Stevens, Robert E., C. Kendall Lister, and James L. Linnane.
1979. Outbreak of a twig beetle, *Pityophthorus opaculus* LeConte, in Colorado. *The Coleopterists Bulletin* 33(3):268-269.

- Tiernan, Charles.
1980. Bugs for beginners. Instructor 89(8):92-93, 106.
- U.S. Dep. Agric. Forest Service.
1979. Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. 100 p.
- Van Sambeek, Jerome W., and John R. Bridges.
1980. Influence of the juvenile hormone analogue, methoprene, on development of the southern pine beetle, *Dendroctonus frontalis* Zimm. (Col., Scolytidae). Zeitschrift für Angewandte Entomologie 89:479-488.
- Weber, Barbara C.
1979. *Xylosandrus germanus* (Blandf.) (Coleoptera: Scolytidae), a new pest of black walnut: a review of its distribution, host plants, and environmental conditions of attack. In Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 63-68.
- Werner, Richard A.
1979. Influence of host foliage on development, survival, fecundity, and oviposition of the spear-marked black moth, *Rheumaptera hastata* (Lepidoptera: Geometridae). Canadian Entomologist 111:317-322.
- Werner, Richard A.
1980. Biology and behavior of a larch bud moth, *Zeiraphera* sp., in Alaska. U.S. Dep. Agric. For. Serv. Research Note PNW-356. 8 p.
- Whitney, E. G., and P. A. Godwin.
1979. Changes in the gross morphology of the ventral nerve cord during metamorphosis of the white pine weevil, *Pissodes strobi* (Peck) (Coleoptera: Curculionidae). International Journal of Insect Morphology and Embryology 8:229-236.
- Wickman, Boyd E., and Roy C. Beckwith.
1978. Life history and habits. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 2.3. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 30-37.
- Wilson, Louis F., and Jeffrey A. Corneil.
1979. The butternut curculio on some hybrid walnuts in Michigan. In Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 35-39.
- Bedard, William D., David L. Wood, Paul E. Tilden, and others.
1980. Field responses of the western pine beetle and one of its predators to host- and beetle-produced compounds. Journal of Chemical Ecology 6(3):625-641.
- Belanger, R.P., R.N. Coulson, J. Lewis, and others.
1979. Southern pine beetle research application and implementation activities for the southern forestry community. U.S. Dep. Agric. For. Serv. and Science and Education Administration, Cooperative Research. 26 p.
- Birch, M.C., D.M. Light, D.L. Wood, and others.
1980. Peromonal attraction and allomonal interruption of *Ips pini* in California by the two enantiomers of ipsdienol. Journal of Chemical Ecology 6(3): 703-717.
- Brookes, Martha H., R.W. Stark, and Robert W. Campbell, editors.
1978. The Douglas-fir tussock moth: a synthesis. U.S. Dep. Agric. Technical Bulletin 1585. 331 p.
- Bustillo, Alex E., and Arnold T. Drooz.
1980. Metodo para la cria masiva del parasito de huevos, *Telenomus alsophilae*. In Seminario sobre plagas forestales. Sociedad Colombiana Entomology, Secc. de Antioquia, Medellin. p. 101-116.
- Byers, J.A., and D.L. Wood.
1980. Interspecific inhibition of the response of the bark beetles, *Dendroctonus brevicornis* and *Ips paraconfusus*, to their pheromones in the field. Journal of Chemical Ecology 6(1):149-164.
- Cameron, E.A., M.L. McManus, and C.J. Mason.
1979. Dispersal and its impact on the population dynamics of the gypsy moth in the United States of America. Bulletin of Entomological Society of Suisse 52:169-179.
- Campbell, Robert W.
1979. Douglas-fir tussock moth pest management. In North America's forests: gateway to opportunity. Proceedings 1978 Joint Convention Society of American Foresters and Canadian Institute of Forestry. p. 273-275.
- Campbell, Robert W., and Max W. McFadden.
1978. Introduction. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 11.1. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 209.
- Campbell, Robert W., and Ronald W. Stark.
1980. The Douglas-fir tussock moth management system. U.S. Dep. Agric. Agricultural Handbook 568. 19 p.
- Cannon, William N., Jr., and David P. Worley.
1980. Dutch elm disease control: performance and costs. Cost updated to 1979 and reaffirmed. U.S. Dep. Agric. For. Serv. Research Paper NE-457. 8 p.

Insect Control and Management Strategies

- Barnett, James P., P.W. Bergman, W.L. Ferguson, and others.
1980. The biologic and economic assessment of endrin. U.S. Dep. Agric. Technical Bulletin 1623. 47 p.

- Colbert, J.J.
1979. Douglas-fir tussock moth population outbreak model. *In* North America's forests: gateway to opportunity. Proceedings 1978 Joint Convention Society of American Foresters and Canadian Institute of Forestry. p. 253-255.
- Colbert, J.J., and Robert W. Campbell.
1978. The integrated model. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 11.5. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 216-230.
- Colbert, J.J., W. Scott Overton, and Curtis White.
1979. Documentation of the Douglas-fir tussock moth outbreak-population model. U.S. Dep. Agric. For. Serv. General Technical Report PNW-89. 85 p.
- Crisp, C.E., T.W. Koerber, C.E. Richmond, and B.H. Roettgering.
1979. Acopetal translocation acephate into terminal shoots of Jeffrey pine for the chemical control of western pine shoot borer. *In* Proceedings, Symposium on Systematic Chemical Treatments in Tree Culture [October 9-11, 1978, East Lansing, Mich.] p. 307-324.
- Daterman, Gary E.
1979. Role of pheromones in forest insect survey and control, chapter 19. *In* Forest Insect Survey and Control, 4th edition. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated. Corvallis. p. 385-404.
- DeBarr, G.L.
1979. Importance of seedbugs *Leptoglossus corculus* (Say) (Hemiptera: Coreidae) and *Tetyra bipunctata* (H.-S.) (Hemiptera: Pentatomidae) and their control in southern pine seed orchards. *In* Proceedings, Flowering and Seed Development in Trees: A Symposium [Mississippi State University, May 1978]. Frank Bonner, ed. p. 330-341.
- Esenher, Glenn R., and Raymond H. Beal.
1979. Termite control: decayed wood bait. *Sociobiology* 4(2):215-222.
- Farris, M.E., and J.E. Appleby.
1980. Chemical control studies of the walnut caterpillar. *Journal of Arboriculture* 6(6):150-152.
- Fellin, David G.
1980. The western spruce budworm in the American Rocky Mountains. Canada/United States Spruce Budworms Program (CANUSA) Newsletter Number 8. 3 p.
- Ferrell, George T.
1980. Risk-rating systems for mature red fir and white fir in northern California. U.S. Dep. Agric. For. Serv. General Technical Report PSW-39. 29 p.
- Furniss, M.M., M.D. McGregor, M.W. Foiles, and A.D. Partridge.
1979. Chronology and characteristics of a Douglas-fir beetle outbreak in northern Idaho. U.S. Dep. Agric. For. Serv. General Technical Report INT-59. 19 p.
- Haverty, Michael I., and Nancy G. Rappaport.
1980. Comparative toxicity of technical Orthene and Orthene 75S to western spruce budworm and Douglas-fir tussock moth, 1979. *Insecticide and Acaricide Tests* 5:202.
- Hendry, L.B., B. Platek, L.E. Browne, and others.
1980. *In vivo* conversion of a labelled host plant chemical to pheromones of the bark beetle *Ips paraconfusus*. *Nature* 284:485.
- Heyd, Robert L., and Louis F. Wilson.
1980. Managing red pine to reduce losses from the Saratoga spittlebug. *In* Forest Pest Management Guidelines for Managers 80-84. Michigan Cooperative Forest Pest Management Program, Michigan State University. p. 7-12.
- Housewart, Mark W., Daniel T. Jennings, Lorraine P. Berkett, and Thomas B. Brann.
1980. Parasitic mites (Acari: Erythraeidae) on spruce budworm moths (Lepidoptera: Tortricidae). *Canadian Entomologist* 112:193-197.
- Hoy, James B.
1980. Ecological impact of lindane on a pine plantation soil microarthropod community. *Environmental Entomology* 9(2):164-174.
- Hughes, K.M.
1978. Description of the viruses. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.2.1. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds., U.S. Dep. Agric. Technical Bulletin 1585. p. 133-136.
- Ignoffo, Carlo M., Mauro E. Martignoni, and James L. Vaughn, editors.
1980. Characterization, production and utilization of entomopathogenic viruses. Proceedings 2nd Conference, Project V, Microbiological Control of Insect Pests, of the US/USSR Joint Working Group on the Production of Substances by Microbiological Means. National Science Foundation, Washington, D.C. 215 p.
- Koerber, Thomas W.
1979. Bole injected systemic insecticides for control of Douglas-fir cone insects. *In* Proceedings, Symposium on Systemic Chemical Treatments in Tree Culture [October 9-11, 1978, East Lansing, Mich.] p. 295-302.
- Kuhlman, George E.
1980. Research on *Fomes annosus* in the United States from 1973-1977. Proceedings Fifth International Conference on Hessische Forstliche Versuchsanstalt. Hannoversch, Munden, Federal Republic of Germany. p. 35-39.
- Lautenschlager, R.A., H. Rothenbacher, and J.D. Podgwaite.
1979. Response of birds to aerial applications of nucleopolyhedrosis virus of the gypsy moth. *Environmental Entomology* 8:760-764.

- Lewis, F.B.
1979. Status and potential of microbials in gypsy moth control. *In* Proceedings 12th Annual Northeast Forest Insect Work Conference.
- Look, Melvin.
1980. A mild method for acylation of O, S-dimethyl phosphoramidodithiolate. *Journal of Agricultural and Food Chemicals* 28:888.
- Maksymiuk, Bohdan.
1979. Application of insecticides, chapter 7. *In* Forest Insect Survey and Control, 4th edition. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 87-124.
- Maksymiuk, Bohdan.
1979. Microbial control of defoliators, chapter 9. *In* Forest Insect Survey and Control, 4th edition. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 135-171.
- Martignoni, Mauro E.
1978. Production, activity, and safety. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.2.3. Martha H. Brookes, R. W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 140-147.
- Martignoni, Mauro E., and Carlo M. Ignoffo.
1980. Biological activity of *Baculovirus* preparations: *in vivo* assay. *In* Characterization, Production and Utilization of Entomopathogenic Viruses. Proceedings 2nd Conference, Project V, Microbiological Control of Insect Pests, of the US/USSR Joint Working Group on the Production of Substances by Microbiological Means. National Science Foundation, Washington, D.C. p. 138-153.
- Mazzone, H.M., W.R. Engler, G. Wray, and others.
1980. High voltage electron microscopy of viral inclusion bodies. Thirty-eighth Annual Proceedings, Electron Microscopy Society of America. p. 486-487.
- McFadden, M.W.
1979. Development of an integrated pest management system for the western spruce budworm. *In* North America's Forests: Gateway to Opportunity. Proceedings 1978 Joint Convention Society of American Foresters and Canadian Institute of Forestry. p. 287-290.
- McFadden, Max W., and Robert W. Campbell.
1978. Prevention. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 12.2. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 235-237.
- McKeague, Marcia, and Gary Simmons.
1979. Effects of insecticidal and cultural methods to release *Acrobasis* spp. and frost injury on black walnut. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 44-50.
- McManus, M.L.
1980. Gypsy moth program accomplishment report. U.S. Dep. Agric., Agricultural Information Bulletin 421. 21 p.
- McManus, M.L., W.E. Wallner, and D.R. Houston.
1979. The homeowner and the gypsy moth: guidelines for its control. U.S. Dep. Agric., Home and Garden Bulletin 227. 34 p.
- McManus, M.L. and R.T. Zerillo.
1978. The gypsy moth: an illustrated biography. U.S. Dep. Agric., Agricultural Handbook 225. 15 p.
- Mott, D. Gordon.
1980. Spruce budworm protection management in Maine. Maine Forestry Review, volume 13, Summer 1980. p. 26-33.
- Neel, W.W., G.L. DeBarr, and W.E. Lambert.
1979. Variability of seedbug damage to pine seed following different methods of applying carbofuran granules to a slash pine seed orchard. *In* Proceedings, Flowering and Seed Development in Trees: A Symposium [Mississippi State University, May 1978]. Frank Bonner, ed. p. 314-322.
- Neissess, John.
1980. Effect of pH and chlorine concentration on activity of *Bacillus thuringiensis* tank mixes. *Journal of Economic Entomology* 73(2):186-188.
- Neissess, John, and M.J. Stelzer.
1978. Laboratory and simulated field tests. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.3.3. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 153-154.
- Newsome, L., and J.D. Solomon.
1980. Control of eriophyid mites on cottonwood with foliar sprays. *Insecticide and Acaricide Tests* 5:187.
- O'Neal, Jerry, and George P. Markin.
1979. Comparison of three aircraft guidance techniques for use under mountainous conditions. *Agricultural Aviation* 20(3):151-158.
- Overhulser, D.L., G.E. Daterman, L. L. Sower, and others.
1980. Mating disruption with synthetic sex attractants controls damage by *Eucosma sonomana* (Lepidoptera: Tortricidae, Olethreutinae) in *Pinus ponderosa* plantations. II. Aerially applied hollow fiber formulation. *Canadian Entomologist* 112(2):163-165.
- Overton, W. Scott, and J.J. Colbert.
1978. Model of foliage dynamics and tree damage. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 4.6. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 88-89.

- Overton, W. Scott, and J. J. Colbert.
1978. Population modeling. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 3.4. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 53-56.
- Overton, W. Scott, and J. J. Colbert.
1978. The outbreak model. *In* The Douglas-fir Tussock Moth: A Synthesis, Chapter 11.2. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 209-210.
- Page, Marion, Richard I. Washburn, and Nicholas L. Crookston.
1980. Acephate reduces populations of needlemining larch casebearer in laboratory. U.S. Dep. Agric. For. Serv. Research Note PSW-344. 2 p.
- Podgwaite, J.D.
1980. Development and utilization of a nucleopolyhedrosis virus (Baculovirus) for control of the gypsy moth. *Memorias, VIII Reunion Nacional De Control Biologico*. 9 p.
- Podgwaite, J.D., and P.R. Galipeau.
1978. Effect of nucleopolyhedrosis virus on two avian predators of the gypsy moth. U.S. Dep. Agric. For. Serv. Research Note NE-251. 2 p.
- Rauch, P.A., B. Ewing, D.L. Wood, and W.D. Bedard.
1980. The information system for research and project management of the western pine beetle IPM project. *In* New technology of pest control. Carl B. Huffaker, ed. John Wiley and Sons, Incorporated, New York, p. 420-429.
- Richmond, Merle L., Charles J. Henny, Randy L. Floyd, and others.
1979. Effects of Sevin-4-Oil, Dimilin, and Orthene on forest birds in Northeastern Oregon. U.S. Dep. Agric. For. Serv. Research Paper PSW-148. 19 p.
- Robertson, Jacqueline L.
1978. Laboratory bioassays. *In* The Douglas-fir Tussock Moth: A Synthesis. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 112-115.
- Robertson, Jacqueline L.
1979. Laboratory evaluation of IGS's on western spruce budworm prior to field testing. *In* Insect growth regulator research on spruce budworm. University of Maine, Life Sciences and Agricultural Experiment Station Miscellaneous Report 219. p. 2-9.
- Robertson, Jacqueline L.
1979. Rearing the western spruce budworm. U.S. Dep. Agric. For. Serv., Washington, D.C. 18 p.
- Robertson, Jacqueline L., and Lucille M. Boelter.
1979. Toxicity of insecticides to Douglas-fir tussock moth, *Orgyia pseudotsugata* (Lepidoptera: Lymantriidae). I. Contact and feeding toxicity. Canadian Entomologist 111:1145-1159.
- Robertson, Jacqueline L., and Lucille M. Boelter.
1979. Toxicity of insecticides to Douglas-fir tussock moth, *Orgyia pseudotsugata* (Lepidoptera: Lymantriidae). II. Residual toxicity and rainfastness. Canadian Entomologist 111:1161-1175.
- Robertson, Jacqueline L., and Lucille M. Boelter.
1979. Toxicity of insecticides to Douglas-fir tussock moth, *Orgyia pseudotsugata* (Lepidoptera: Lymantriidae). II. Residual toxicity and rainfastness. Canadian Entomologist 111:1161-1175.
- Robertson, Jacqueline L., and Richard A. Kimball.
1979. Effects of insect growth regulators on the western spruce budworm (*Choristoneura occidentalis*) (Lepidoptera: Tortricidae). I. Lethal effects of last instar treatments. Canadian Entomologist 111:1361-1368.
- Robertson, Jacqueline L., and Richard A. Kimball.
1979. Effects of insect growth regulators on the western spruce budworm (*Choristoneura occidentalis*) (Lepidoptera: Tortricidae). II. Fecundity and fertility reduction following last instar treatments. Canadian Entomologist 111:1369-1380.
- Robertson, Jacqueline L., and Richard A. Kimball.
1980. Toxicities of topically applied insecticides to Douglas-fir tussock moth, 1979. Insecticide and Acaricide Tests 5:202.
- Robertson, Jacqueline L., and Richard A. Kimball.
1980. Toxicities of topically applied insecticides to western spruce budworm, 1979. Insecticide and Acaricide Tests 5:203.
- Robertson, Jacqueline L., and Nancy G. Rappaport.
1979. Direct, indirect, and residual toxicities of insecticide sprays on western spruce budworm, *Choristoneura occidentalis* (Lepidoptera: Tortricidae). Canadian Entomologist 111:1219-1226.
- Robertson, Jacqueline L., Robert M. Russell, and N.E. Savin.
1980. POLO: a user's guide to Probit Or LOGit analysis. U.S. Dep. Agric. For. Serv. General Technical Report PSW-38, 15 p.
- Russell, Robert M., and Jacqueline L. Robertson.
1979. Programming probit analysis. Bulletin of the Entomological Society of America 25(3):191-192.
- Ryan, R.B.
1979. Biological control with natural enemies, chapter 10. *In* Forest Insect Survey and Control, 4th edition. J. A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 173-194.
- Ryan, Roger B.
1979. Illustrated key to introduced and common native parasites of larch casebearer. U.S. Dep. Agric. For. Serv. Research Paper PNW-262. 12 p.

- Sartwell, Charles, G.E. Daterman, L.L. Sower, and others.
1980. Mating disruption with synthetic sex attractants controls damage by *Eucosma sonomana* (Lepidoptera: Tortricidae, Olethreutinae) in *Pinus ponderosa* plantations. I. Manually applied polyvinyl chloride formulation. Canadian Entomologist 112(2):159-162.
- Simmons, G.A.
1980. Use of light trap data to predict outbreaks of the spruce budworm. Department of Entomology, Michigan State University, East Lansing, Mich. Information Report 80-6. 13 p.
- Sower, Lonnie L.
1978. Pheromones. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 6.3. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 120-122.
- Sower, L.L., G.E. Daterman, R.D. Orchard, and C. Sartwell.
1979. Reduction of Douglas-fir tussock moth reproduction with synthetic sex pheromone. Journal of Economic Entomology 72(5):739-742.
- Sower, L. L., and T. R. Torgersen.
1979. Field application of synthetic Douglas-fir tussock moth sex pheromone did not reduce egg parasitism by two hymenoptera. Canadian Entomologist 111:751-752.
- Stelzer, M.J.
1979. How to determine the occurrence of virus in egg masses. U.S. Dep. Agric., Agricultural Handbook 548. 7 p.
- Stelzer, M.J., and John Neisess.
1978. Field efficacy tests. In The Douglas-fir Tussock Moth: A Synthesis Chapter 7.2.5. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 149-152.
- Stelzer, M.J., and John Neisess.
1978. Field efficacy tests. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.3.4. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 154-156.
- Stelzer, M.J., and John Neisess.
1978. Formulations, activity, and safety. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.3.2. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 153.
- Stelzer, M.J., C.G. Thompson, and Bohdan Maksymiuk.
1978. Description and mode of action. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.3.1. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 152-153.
- Stevens, Robert E., William F. McCambridge, and Carlton B. Edminister.
1980. Risk rating guide for mountain pine beetle in Black Hills ponderosa pine. U.S. Dep. Agric. For. Serv. Research Note RM-385. 2 p.
- Stock, M.W., and J.L. Robertson.
1979. Differential response of Douglas-fir tussock moth, *Orygia pseudotsugata* (Lepidoptera: Lymantriidae), populations and sibling groups to acephate and carbaryl: toxicological and genetic analyses. Canadian Entomologist 111: 1231-1239.
- Stock, Mary W., and Jacqueline L. Robertson.
1978. Genetic indicators of insecticide response. In The Douglas-fir Tussock Moth: A Synthesis. U.S. Dep. Agric. Technical Bulletin 1585. p. 116-117.
- Thompson, C.G.
1978. Introduction. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.1. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 133.
- Thompson, C.G.
1978. Nuclear polyhedrosis epizootiology. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.2.2. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 136-140.
- Thompson, C.G., and Bohdan Maksymiuk.
1978. Laboratory and simulated field tests. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 7.2.4. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 147-149.
- Torgersen, Torolf R., and Donald L. Dahlsten.
1978. Natural mortality. In The Douglas-fir Tussock Moth: A Synthesis, Chapter 3.3. Martha H. Brookes, R.W. Stark, and Robert W. Campbell, eds. U.S. Dep. Agric. Technical Bulletin 1585. p. 47-53.
- Torgersen, Torolf R., and Richard R. Mason.
1979. Predation and parasitization of Douglas-fir tussock moth egg masses. U.S. Dep. Agric., Agricultural Handbook 549. 11 p.
- Werner, Richard A., and J. Weatherston.
1980. A synthetic sex pheromone for the large aspen tortrix in Alaska. U.S. Dep. Agric. For. Serv. Research Note PNW-354. 4 p.
- Wilson, Louis F.
1980. Management guidelines for pine root collar weevil. In Forest Pest Management Guidelines Manual 80-4. Michigan Cooperative Forest Pest Management Program, Michigan State University, East Lansing. p. 23-28.
- Wilson, Louis F.
1980. Management guidelines for redheaded pine sawfly. In Forest Pest Management Guidelines Manual 80-4. Michigan Cooperative Forest Pest Management Program, Michigan State University, East Lansing. p. 19-21.
- Wollerman, Edward H.
1980. Attraction of European elm bark beetles, *Scolytus multistriatus*, to pheromone-baited traps. Journal of Chemical Ecology 5(5):781-793.

- Zinkl, Joseph G., Richard B. Roberts, Charles J. Henny, and David J. Lenhard.
1980. Inhibition of brain cholinesterase activity in forest birds and squirrels exposed to aerially applied acephate. *Bulletin of Environmental Contamination Toxicology* 24:676-683.

Disease Detection and Evaluation

- Amman, Gene D.
1980. Incidence of mountain pine beetle abandoned galleries in lodgepole pine. U.S. Dep. Agric. For. Serv. Research Note INT-284. 6 p.
- Berry, Frederick H.
1980. Evaluation of chestnut test plantings in the eastern United States. U.S. Dep. Agric. For. Serv. Research Paper NE-454. 5 p.
- Drummond, David B., and Frank G. Hawksworth.
1979. Dwarf mistletoe in western hemlock in southeastern Alaska. U.S. Dep. Agric. For. Serv., Methods Applications Group Forest Insect and Disease Management Report 79-6. 14 p.
- Eslyn, Wallace E., and Joe W. Clark.
1979. Wood bridges — decay inspection and control. U.S. Dep. Agric., Agricultural Handbook 557. 32 p.
- Filer, T. H., Jr.
1979. Hardwood diseases in plantations and nurseries. *In* Proceedings 1978 Southern Nursery Conference. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP6. p. 165-166.
- Gibbs, J. N., D. R. Houston, and E. B. Smalley.
1979. Aggressive and non-aggressive strains of *Ceratocystis ulmi* in North America. *Phytopathology* 69(11):1215-1219.
- Hawksworth, Frank G., and Alex M. Shigo.
1980. Dwarf mistletoe on red spruce in the White Mountains, New Hampshire. *Plant Disease* 64:880-882.
- Hibben, Craig R., Robert F. Bozareh, and Judith Reese.
1980. Identification of tobacco necrosis virus in deteriorating clones of aspen. *Forest Science* 25(4):557-567.
- Hodges, Charles S.
1980. The taxonomy of *Diaporthe cubensis*. *Mycologia* 72(3):542-548.
- Little, Silas.
1979. Sweetfern blister rust cankers on loblolly pines in a southern New Jersey plantation. *Bulletin of the New Jersey Academy of Science* 24(2):70-72.
- Rossman, Amy Y., and K. C. Lu.
1980. Filamentous fungi associated with leaf surfaces of red alder and Douglas-fir seedlings in western Oregon. *Mycotaxon* 10(2):369-371.

- Shortle, Walter C.
1979. Detection of decay in trees. *Journal of Arboriculture* 5:226-232.
- Skilling, Darroll D.
1979. An update on research and detection of Scleroderma canker. *In* Minutes of the Fifty-fifth Annual Century Plant Board Meeting. p. 66-67.
- Skilling, Darroll D.
1979. Rhabdocline needlecast of Douglas-fir found in Wisconsin. *Plant Disease Reporter* 63(8):626.
- Thies, Walter G., and Robert D. Harvey, Jr.
1979. A photographic method for measuring tree defect. *Canadian Journal of Forest Research* (4):541-543.

Disease Biology

- Anderson, Neil A., and Ralph L. Anderson.
1980. Leaf and shoot blight of aspen caused by *Venturia macularis* in Northern Minnesota. *Plant Disease* 64:558-559.
- Cromack, Kermit, Jr., Phillip Sollins, William C. Graustein, and others.
1979. Calcium oxalate accumulation and soil weathering in mats of the hypogeous fungus *Hysterangium crassum*. *Soil Biology and Biochemistry* 11:463-468.
- Gibbs, J. N.
1980. Role of *Ceratocystis piceae* in preventing infection by *Ceratocystis fagacearum* in Minnesota. *Transactions British Mycological Society* 74(1): 171-174.
- Gibbs, J. N., D. R. Houston, and E. B. Smalley.
1979. Aggressive and non-aggressive strains of *Ceratocystis ulmi* in North America. *Phytopathology* 69:1215-1219.
- Green, R. J., Jr., and R. C. Ploetz.
1979. Root rot of black walnut seedlings caused by *Phytophthora citricola*. *In* Walnut Insects and Diseases, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 5-10.
- Harvey, Alan E., Martin F. Jurgensen, and Michael J. Larsen.
1980. Ecology of ectomycorrhizae in northern Rocky Mountain forests. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 188-210.
- Hawksworth, Frank G., and Delbert Wiens.
1980. A new species of *Arceuthobium* (Viscaceae) from Central Mexico. *Brittonia* 32:348-352.

- Highley, T.L., and T. Kent Kirk.
1979. Mechanisms of wood decay and the unique features of heartrots. *Phytopathology* 69(10):1151-1157.
- Hinds, T.E.
1980. Cryptosphaeria canker of aspen. Proceedings of the 27th Western International Forest Disease Work Conference [September 25-28, 1979, Salem, Oreg.]. p. 96-97.
- Houston, David R.
1979. Spreading tree disease; the hand of Man. *The Ecologist* (4/5):120-124.
- Houston, David R.
1980. Beech bark disease: what we do and do not know. *Annales des Sciences Forestieres* 4/80.
- Hudler, George W., Nagayoshi Oshima, and F.G. Hawksworth.
1979. Bird dissemination of dwarf mistletoe on ponderosa pine in Colorado. *The American Midland Naturalist* 102(2):273-280.
- Jaramillo, Annabelle E.
1980. Wound periderm formation in *Juniperus occidentalis* in response to *Arceuthobium campylopodum*. *Canadian Journal of Botany* 58(3):400-403.
- Kessler, Kenneth J., Jr.
1979. Premature loss of developing black walnut fruit. In *Walnut Insects and Diseases*, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 1-4.
- Kliejunas, J.T., and J.T. Nagata.
1979. *Phytophthora cinnamomi* in Hawaiian soils: seasonal variations in population levels. *Phytopathology* 69(12):1268-1272.
- Kliejunas, J.T., and J.T. Nagata.
1979. *Phytophthora cinnamomi* in Hawaiian forest soils: technique for enumeration and types of propagules recovered. *Soil Biology and Biochemistry* 12:89-91.
- Kliejunas, J.T., R.F. Scharpf, and R.S. Smith, Jr.
1979. *Teichospora obducens* and a *pleospora* species on *Korthalsella* in Hawaii. *Plant Disease Reporter* 63(12):1060-1062.
- Knutson, Donald M.
1979. How parasitic seed plants induce disease in other plants, chapter 16. *Plant Disease* 4:293-312.
- Knutson, Donald M., and Anita Stiebrs Hutchins.
1979. *Wallrothiella arceuthobii* infecting *Arceuthobium douglasii*: culture and field inoculation. *Mycologia* 71(4):821-828.
- Larsen, Michael J., Frances F. Lombard, and Paul E. Aho.
1979. A new variety of *Phellinus pini* associated with cankers and decay in white firs in southwestern Oregon and northern California. *Canadian Journal of Forest Research* 9:31-38.
- Lewis, R., Jr., and F.L. Oliveria.
1979. Live oak decline in Texas. *Journal of Arboriculture* 5:241-244.
- Li, Ching Y.
1979. Light and temperature induced sporocarp formation of *Phellinus weirii*. *Canadian Journal of Forest Research* 9(4):535-538.
- Livingston, C.H., T.E. Hinds, C.E. Seliskar, and R.E. Klein.
1979. A "drooping" malady of western aspen. *Plant Disease Reporter* 63(11): 923-927.
- Martin, Neil B.
1980. Interactions of pectins and tissues of *Cronartium ribicola* and *Pinus monticola* in culture. U.S. Dep. Agric. For. Serv. Research Paper INT-250. 5 p.
- Matteoni, James A., and Dan Neely.
1979. *Gnomonia leptostyla*: growth, sporulation, and heterothalasm. *Mycologia* 71(5):1034-1042.
- Merrill, William, and Alex L. Shigo.
1979. An expanded concept of tree decay. *Phytopathology* 69:1158-1160.
- Miller, Orson K., Jr., John G. Palmer, and Linnea S. Gillman.
1980. The fruiting and development of *Rhodotus palmatus* in culture. *Mycotaxon* 11(2):409-419.
- Neely, Dan.
1979. Etiology, epidemiology and control of black walnut anthracnose. In *Walnut Insects and Diseases*, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 58-62.
- Nicholls, Thomas H.
1979. Butternut canker. In *Walnut Insects and Diseases*, Workshop Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report NC-52. p. 73-82.
- Peterson, Glenn W., and Jerry W. Riffle.
1979. Tree diseases and windbreak management. In *Windbreak Management*. Great Plains Agriculture Council Publication 92. p. 49-59.
- Powers, H.R., Jr.
1980. Pathogenic variation among single-aeciospore isolates of *Cronartium quercuum* f. sp. *fusiforme*. *Forest Science* 26:280-282.
- Powers, H.R., Jr., and F.R. Matthews.
1979. Interactions between virulent isolates of *Cronartium quercuum* f. sp. *fusiforme* and loblolly pine families of varying resistance. *Phytopathology* 69:720-722.
- Riffle, Jerry W.
1980. Growth and endomycorrhizal development of broadleaf seedlings in fumigated nursery soil. *Forest Science* 26:403-413.

1980. Know your forest diseases: true mistletoe on white fir. *In* Forest Pest Conditions in California — 1979. California Forest Pest Control Action Council, Sacramento, Calif. p. 16-17.
- Shaw, C.G., III, and E.R. Florance.
1979. Scanning electron microscopy reveals differences in surface morphology between basidiospores and conidia of *Heterobasidion annosum*. European Journal of Forest Pathology 9:249-254.
- Shigo, Alex L.
1979. Compartmentalization of decay associated with *Heterobasidion annosum* in roots of *Pinus resinosa*. European Journal of Forest Pathology 9:341-347.
- Shigo, Alex L., Richard Campana, Fay Hyland, and Janet Anderson.
1980. Anatomy of elms injected to control Dutch elm disease. Journal of Arboriculture 6:96-100.
- Shigo, Alex L., and Walter C. Shortle.
1979. Compartmentalization of discolored wood in heartwood of red oak. Phytopathology 69:710-711.
1979. In vitro dual culture of *Tuberculina maxima* and *Cronartium ribicola*. Phytopathologische Zeitschrift 96:185-189.

Disease Control and Management Strategies

- Allison, J.R., and G.F. Gregory.
1979. How to save Dutch elm diseased trees by pruning. U.S. Dep. Agric. For. Serv. Northeastern Area, State and Private Forestry NA-GR-9. 2 p.
- Cannon, William N., Jr., and David P. Worley.
1980. Dutch elm disease control: Performance and costs. U.S. Dep. Agric. For. Serv. Research Paper NE-457. 8 p.
- De Groot, Rodney C., William C. Feist, Wallace E. Eslyn, and Lee R. Gjovik.
1979. Protecting wood fences for yard and garden. University of Wisconsin Extension Publication A3052. 5 p.
- De Groot, Rodney C., and Bruce R. Johnson.
1979. Preservative treatment of wood for farm use. University of Wisconsin Extension Publication A2982. 12 p.

- Eslyn, Wallace E.
1979. Efficacy of organic acids in protection of tropical American woods stored in the form of chips. *Material and Organismen* 14(3):185-192.
- Feist, William C.
1980. Protecting woodwork without preservatives. *Parks* 4(4):17-19.
- Feist, William C., and Edward A. Mraz.
1980. Performance of mildewcides in a semitransparent stain wood finish. *Forest Products Journal* 30(5):43-46.
- Gjovik, L.R., and H.L. Davidson.
1979. Comparison of wood preservatives in stake tests (1979 progress report). U.S. Dep. Agric. For. Serv. Research Note FPL-02. 80 p.
- Gregory, Garold F.
1979. Problems in control of Dutch elm disease by injection of systemic fungicides. *In* Proceedings of the Symposium on Systemic Chemical Treatments in Tree Culture. Michigan State University, East Lansing. p. 195-202.
- Hansen, E.M.
1979. Survival of *Phellinus weirii* in Douglas-fir stumps after logging. *Canadian Journal of Forest Research* 9(4):484-488.
- Hansen, Everett M.
1978. The survival of *Phellinus weirii* in Douglas-fir stumps on sites regenerated to red alder and Douglas-fir. *Proceedings, 5th Conference on Root and Butt Rot in Conifers* [International Union of Forestry Research Organizations, Kassell, Germany]. p. 328-332.
- Houston, David R.
1979. Understanding the game of the environment. U.S. Dep. Agric., *Agricultural Information Bulletin* 426. 174 p.
- Kais, A.G.
1979. Control of brown-spot needle blight of longleaf pine. *In* Proceedings 1978 Southern Nursery Conference. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP6. 167 p.
- Lewis, R., Jr.
1979. Control of live oak decline in Texas with lignasan and arbotech. *In* Proceedings National Symposium on Systemic Chemical Treatments in Tree Culture. Michigan State University, East Lansing. p. 239-246.
- McManus, M.L., D.R. Houston, and W.E. Wallner.
1979. The homeowner and the gypsy moth: guidelines for control. U.S. Dep. Agric. Home and Garden Bulletin 227. 34 p.
- Mexal, John, G.A. Snow, and W.G. Morris.
1979. Fusiform rust control with systemic fungicides. *In* Proceedings 1978 Southern Nursery Conference. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP6. p. 149-154.
- Nelson, E.E., and C.Y. Li.
1980. Preliminary test of two stump surface protectants against *Fomes annosus*. U.S. Dep. Agric. For. Serv. Research Note PNW-363. 6 p.
- Nicholls, Thomas H.
1979. Dangers of red pine monoculture. *In* Proceedings First North Central Tree Improvement Conference [August 21-23, 1979]. p. 104-108.
- Ostry, Michael E.
1979. Disease research of poplars grown under intensive culture in the north central region of the United States. *In* Proceedings 16th Annual Meeting, North American Poplar Council [August 14-17, 1979]. p. 83-91.
- Ostry, Michael E., and Thomas H. Nicholls.
1979. Eastern dwarf mistletoe on black spruce. U.S. Dep. Agric. For. Serv. Insect and Disease Leaflet 158. 7 p.
- Peterson, Glenn W.
1979. Control of *Diplodia* and *Dothistroma* blights of pines in the urban environment. *Proceedings Midwestern Chapter, International Shade Tree Conference* 34:48-53.
- Rowan, S.J.
1979. Rainfall and frequency of ferbam sprays important for fusiform rust control. *Southern Journal of Applied Forestry* 3:167-168.
- Rowan, S.J.
1980. Planting depth and seedbed mulch affect germination of slash pine seeds. U.S. Dep. Agric. For. Serv. Research Note SE-292. 3 p.
- Rowan, S.J., C.E. Cordell, and C.E. Affelttranger.
1980. Fusiform rust losses, control costs, and relative hazard in southern forest tree nurseries. U.S. Dep. Agric. For. Serv. Tree Planters' Notes 31(2):3-8.
- Scharpf, Robert F.
1979. Dwarf mistletoe-infected red fir: growth after release. U.S. Dep. Agric. For. Serv. Research Paper PSW-143. 9 p.
- Schipper, Arthur L., Jr.
1979. Hypoxylon canker of aspen. U.S. Dep. Agric. For. Serv. Forest Insect and Disease Leaflet 6. 7 p.
- Schreiber, L.R., and G.F. Gregory.
1980. Influence in a benzinadazole-tolerant isolate of *Ceratocystis ulmi* on the control of Dutch elm disease with methyl 2-benzimidazole carbamate phosphate. *Phytopathology* 70(5):444-446.
- Shaw, C.G., III, and R. Molina.
1980. Formation of ectomycorrhizae following inoculation of containerized Sitka spruce seedlings. U.S. Dep. Agric. For. Serv. Research Note PNW-351. 8 p.

- Shigo, Alex L.
1980. New developments in tree care in USA. *In* Proceedings of the International Conference on Urban Forestry (Quebec). p. 320-327.
- Shortle, Walter C.
1979. New ideas in tree care, 1979. *Turf Bulletin* 15(3):3-5.
- Shortle, Walter C.
1979. Tree care: a new look, 1979. *Journal of Arboriculture* 5:281-284.
- Snow, G.A., S.J. Rowan, J.P. Jones, and others.
1979. Using Bayleton (triadimefon) to control fusiform rust in pine tree nurseries. U.S. Dep. Agric. For. Serv. Research Note SO-253. 5 p.
- Smith, Kevin, Robert O. Blanchard, and Walter C. Shortle.
1979. Effect of spore load of *Trichoderma harzianum* on wood-invading fungi and volume of discolored wood associated with wounds on *Acer rubrum*. *Plant Disease Reporter* 63:1070-1071.
- Staley, J.M.
1980. Lophodermium control in Pacific Northwest Scot's pine. *In* Proceedings 27th Western International Forest Disease Work Conference [September 25-28, 1979, Salem, Oreg.]. p. 72-73.
- Walkinshaw, C.H., T.R. Dell, and S.D. Hubbard.
1980. Predicting field performance of slash pine families from inoculated greenhouse seedlings. U.S. Dep. Agric. For. Serv. Research Paper SO-160. 6 p.

Air Pollution

- Carlson, C.
1980. Kraft mill gases damage Douglas-fir in western Montana. *European Journal of Forest Pathology* 10:141-151.
- Cowling, E.B., and L.S. Dochinger.
1979. The changing chemistry of atmospheric deposition and its beneficial and detrimental effects on biological systems. *In* Proceedings, Ninth Conference Environmental Toxicology Aerospace Medical Research Laboratory — Technical Review — 79-68:283-303.
- Dochinger, Leon S.
1980. Interception of airborne particles by tree plantings. *Journal of Environmental Quality* 9(2):265-268.
- James, R.L., F.W. Cobb, Jr., P.R. Miller, and J.R. Parmeter, Jr.
1980. Effects on oxidant air pollution on susceptibility of pine roots to *Fomes annosus*. *Phytopathology* 70(6):560-563.

- Jensen, Keith F.
1979. A comparison of height growth and leaf parameters of hybrid poplar cuttings grown in ozone-fumigated atmospheres. U.S. Dep. Agric. For. Serv. Research Paper NE-446. 3 p.
- Jensen, Keith F., and Leon S. Dochinger.
1979. Growth responses of woody species to long- and short-term fumigation with sulfur dioxide. U.S. Dep. Agric. For. Serv. Research Paper NE-442. 7 p.
- Noble, Reginald, and Keith F. Jensen.
1980. Effects of sulfur dioxide and ozone on growth of hybrid poplar leaves. *American Journal of Botany* 67(7):1005-1009.
- Noble, Reginald, David Pechak, and Keith Jensen.
1980. Ozone effects on the ultrastructure of the chloroplasts of hybrid poplar leaves. *Micron* 11:13-14.

Wood Products Organisms

- Ambergey, Terry L.
1979. Review and checklist of the literature on interactions between wood-inhabiting fungi and subterranean termites: 1960-1978. *Sociobiology* 4(2):279-296.
- Amburgey, Terry L., and Eldon A. Behr.
1979. Accelerated method for testing wood preservatives for aboveground use. *Material und Organismen* 14(2):141-152.
- Beal, Raymond H.
1979. Preventing termite attack by adding insecticide to particleboard, hardboard, and plywood adhesive. *Forest Products Journal* 29(12):29-34.
- Beal, Raymond H.
1980. The use of chemicals for termite control: methods and techniques used worldwide. *Sociobiology* 5(2):163-170.
- Beal, Raymond H., and Glenn R. Esenther.
1980. A new approach to subterranean termite control — the bait-block method. *Sociobiology* 5(2):171-174.
- Behr, Eldon A., and Virgil K. Smith.
1979. Testing termite resistance (*Reticulitermes*) of wood in exterior exposure. *Material und Organismen* 14(4):259-268.
- Blomquist, Gary J., Ralph W. Howard, and C.A. McDaniel.
1979. Biosynthesis of the cuticular hydrocarbons of the termite *Zootermopsis angusticollis* (Hagen). Incorporation of propionate into dimethylalkanes. *Insect Biochemistry* 9:371-374.

- Blomquist, Gary J., Ralph W. Howard, and C.A. McDaniel.
1979. Structures of the cuticular hydrocarbons of the termite *Zootermopsis angusticollis* (Hagen). *Insect Biochemistry* 9:365-370.
- Blomquist, Gary J., Ralph W. Howard, C.A. McDaniel, and others.
1980. Application of methoxymercuration-demercuration followed by mass spectrometry as a convenient microanalytical technique for double-bond location in insect-derived alkenes. *Journal of Chemical Ecology* 6(1):257-269.
- Esenther, Glenn R., and Raymond H. Beal.
1979. Termite control: decayed wood bait. *Sociobiology* 4(2):215-222.
- Haverty, Michael I.
1979. Selection of tunneling substrates for laboratory studies with three subterranean termite species. *Sociobiology* 4(3):315-320.
- Howard, Ralph W.
1980. Effects of methoprene on colony foundation by alates of *Reticulitermes flavipes* (Kollar). *Journal of the Georgia Entomological Society* 15(3):281-285.
- Howard, Ralph W.
1980. Trail-following by termitophiles. *Annals of the Entomological Society of America* 73(1):36-38.
- Howard, Ralph W., and Michael I. Haverty.
1979. Termites and juvenile hormone analogues: a review of methodology and observed effects. *Sociobiology* 4(2):269-278.
- Johnson, Bruce R.
1980. Permeability changes induced in three western conifers by selective bacterial inoculation. *Wood and Fiber* 11(1):10-21.
- Johnson, Bruce R.
1980. Responses of wood decay fungi to polyoxin D, an inhibitor of chitin synthesis. *Material and Organismen* 15(1):9-24.
- Kistner, David H., and Ralph W. Howard.
1980. First report of larval and pupal Trichopseniinae: external morphology, taxonomy and behavior (Coleoptera: Staphylinidae). *Sociobiology* 5(1):3-20.
- Mauldin, Joe K., and Nely M. Rich.
1980. Effect of chlortetracycline and other antibiotics on protozoan numbers in the eastern subterranean termite. *Journal of Economic Entomology* 73(1):123-128.
- Palmer, J.G., and W.E. Eslyn.
1980. Monographic information on *Serpula (Poria) incrassata* according to the "Model Questionnaire for Preparation of Monographic Cards for Wood Destroying Fungi." The International Research Group on Wood Preservation, Working Group I: Biological Problems, Document Number IRG/WP/160. 61 p.
- Smith, Virgil K.
1979. Improved techniques designed for screening candidate termiticides on soil in the laboratory. *Journal of Economic Entomology* 72(6):877-879.
- Williams, Lonnie H.
1980. Changes in wood processing and use have influenced the likelihood of beetle infestations in seasoned wood. U.S. Dep. Agric. For. Serv. General Technical Report SO-28. 10 p.
- Williams, Lonnie H., and Jeffery P. La Fage.
1979. Quarantine of insects infesting wood in international commerce. *In* Forest Insect Survey and Control. J.A. Rudinsky, ed. Oregon State University Book Stores, Incorporated, Corvallis. p. 417-444.
- Williams, Lonnie H., and Jeffery P. La Fage.
1979. Tracking the lyctid beetle. *Southern Lumberman* 239(2968):112.
- Zabel, Robert A., Frances F. Lombard, and Allen M. Kenderes.
1980. Fungi associated with decay in treated Douglas-fir transmission poles in the northeastern United States. *Forest Products Journal* 30(4):51-56.

PRODUCTS AND ENGINEERING

Improving Forest Engineering Systems

- Arola, Rodger A.
1980. Forest Service tests unique steep terrain feller-buncher. *American Logger and Lumberman* 5(4):12-13.
- Biltonen, Frank E., James A. Mattson, and Edsel D. Matson.
1979. The cost of debarked whole-tree chips: stump to digester. U.S. Dep. Agric. For. Serv. Research Paper NC-174. 8 p.
- Falk, Gary D., and Penn A. Peters.
1979. A preliminary analysis of the lateral yarding forces in a cable thinning. *In* International Union of Forestry Research Organizations Mountain Logging Symposium [University of Washington, Seattle, September 1979]. p. 75-79.
- Gardner, Rulon B.
1979. Skyline logging productivity under alternative harvesting prescriptions and levels of utilization in larch-fir stands. U.S. Dep. Agric. For. Serv. Research Paper INT-247. 35 p.
- Gochenour, D.L., Jr., E.L. Fisher, and H.G. Gibson.
1980. I.E. principles applied to forest conservation. *Industrial Engineering* 12(1):14-19.
- Goulet, Daniel V., Ronald H. Iff, and Donald L. Sirois.
1979. Tree-to-mill forest harvesting simulation models: where are we? *Forest Products Journal* 29(10):50-55.

Products and Engineering

- Goulet, Daniel V., Ronald H. Iff, and Donald L. Sirois.
1980. Five forest harvesting simulation models, part I: modeling characteristics. *Forest Products Journal* 30(7):17-20.
- Goulet, Daniel V., Ronald H. Iff, and Donald L. Sirois.
1980. Five forest harvesting simulation models, part II: paths, pitfalls, and other considerations. *Forest Products Journal* 30(8):18-22.
- Hartsog, William S., and James Cass.
1979. Statistical analysis of balloon logging time and motion data. U.S. Dep. Agric. For. Serv. Research Paper INT-239. 15 p.
- Iff, Ronald H., and Ruth Coy.
1979. Development of modern cable logging systems in the south. *Southern Lumberman* 239(2968):91-92.
- Johnson, James A., William A. Hillstrom, Edwin Miyata, and Stephen G. Shetron.
1979. Strip selection method of mechanized thinning in northern hardwood pole size stands. Michigan Technology University, L'Anse. Research Note 27. 13 p.
- Johnson, James A., William A. Hillstrom, Edwin S. Miyata, and Stephen G. Shetron. 1980. Strip selection method of mechanized thinning in northern hardwood pole sized stands. *Northern Logger* 28(11):26-27, 58-60.
- Johnson, L.R., and E.L. Fisher.
1980. Describing the physical environment of timber harvesting simulation models. *In Proceedings of Summer Computer Simulation Conference* [Seattle, Wash., August 1980]. 5 p.
- King, A.L.
1979. Measuring soil compaction in mechanically thinned pine plantations. *American Society of Agricultural Engineers, Paper* 79-1600. 8 p.
- King, Tony, and Sharon Haines.
1979. Soil compaction absent in plantation thinning. U.S. Dep. Agric. For. Serv. Research Note SO-251. 4 p.
- Mann, Charles N.
1979. A running skyline system for harvesting small logs. Society of Automotive Engineers, Warrendale, Pa., SAE Technical Paper 790781. 7 p.
- Mann, Charles N., and Ronald W. Mifflin.
1979. Operational test of the prototype peewee yarder. U.S. Dep. Agric. For. Serv. General Technical Report PNW-92. 7 p.
- Mattson, James A.
1980. Forest residue energy potentials. *In Proceedings of Society of American Foresters* 1979:307-315.
- Mifflin, Ronald W., and Hilton H. Lysons.
1979. Glossary of forest engineering terms. U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station, Portland, Ore. 24 p.

- Miyata, Edwin S.
1979. How to calculate machine costs of operating logging equipment. U.S. Dep. Agric. For. Serv., North Central Forest Experiment Station, St. Paul, Minn. 5 p.
- Miyata, Edwin S.
1980. Determining fixed and operating costs of logging equipment. U.S. Dep. Agric. For. Serv. General Technical Report NC-55. 16 p.
- Mooney, E.L., D.F. Gibson, and T.E. Lehman.
1979. Mine planning and evaluation with a dedicated computer graphics system. *In Application of computer methods in the mineral industry, volume II*. T. O'Neil, ed. Society of Mining Engineers, New York. p. 269-278.
- Plummer, R.W., E.L. Fisher, and D.L. Gochenour, Jr.
1979. Noise measurement control for timber harvesting machines. *In Proceedings of the Human Factor Society, 23rd Annual Meeting* [Boston, Mass., November 1979]. p. 237-241.
- Sturos, John A.
1979. Segregation processes for urban waste wood. *In Urban Waste Wood Utilization, Proceedings of a Conference on Alternatives to Urban Waste Wood Disposal*. U.S. Dep. Agric. For. Serv. General Technical Report SE-16. p. 85-94.
- Winsauer, Sharon A., and John N. Underwood.
1980. Computer simulation of forest harvesting systems, development, and application. *Transactions of the American Society of Agricultural Engineers — General Edition* 23(2):317-323.

Wood Engineering

- Cheng, Shun, and T. Gerhardt.
1980. Laminated beams of isotropic or orthotropic materials subjected to temperature change. U.S. Dep. Agric. For. Serv. Research Paper FPL-375. 27 p.
- Chudnoff, M.
1980. Tropical timbers of the world. U.S. Dep. Agric. For. Serv., Forest Products Laboratory, unnumbered report. 826 p.
- Galligan, W.L., and D.W. Green.
1980. Development of standardized concepts for assignment and assessment of the mechanical properties of lumber — a continuing challenge for the 80's. *Forest Products Journal* 30(9):39-46.
- Gerhards, C.C.
1980. Effect of cross grain on stress waves in lumber. U.S. Dep. Agric. For. Serv. Research Paper FPL-368. 9 p.

- Green, David W.
1980. The effect of density on the modulus ratio of wood. *In* General Constitutive Relationships for Wood and Wood-based Materials: National Science Foundation Workshop Proceedings [Blue Mountain Lake, New York, July 1978]. Syracuse University. p. 347-349.
- Heebink, T.B.
1977. Sound-level differences reveal acoustical isolation between living units. *Sound and Vibration* (June). p. 18-19.
- Heebink, T.B.
1977. Upgrading the sound-insulating efficiency of wood joist floor-ceiling systems. *Sound and Vibration* (June). p. 16-18.
- Holmes, Carlton A., Herbert W. Eickner, John J. Brenden, and others.
1980. Fire development and wall endurance in sandwich and wood-frame structures. U.S. Dep. Agric. For. Serv. Research Paper FPL-364. 27 p.
- Johnson, Richard A.
1980. State-of-the-art report. Current statistical methods for estimating lumber properties by proofloading. *Forest Products Journal* 30(1):14-22.
- McCutcheon, William J., Roger L. Tuomi, Ronald W. Wolfe, and David S. Gromala.
1979. Toward improved structural design of housing components. *In* Housing: Planning, Financing, Construction, Volume 2. [Proceedings of International Conferences on Housing, Planning, Financing, Construction, December 2-7, Miami Beach, Fla.] p. 734-739.
- Muchmore, Frank W., and Roger L. Tuomi.
1980. Alaska's native log bridges. *Civil Engineering* 50(2):54-55.
- Murphy, Joseph F.
1979. Lateral resistance of new and relay red oak crossties. National Technical Information Services Report FRA/ORD-79-03. 67 p.
- Pellerin, Roy F., and Charles C. Gerhards.
1979. Evaluation of a portable machine for testing lumber in bending, final report. Washington State Univ., Pullman, Research Report Number 79/57-43. 55 p.
- Polensek, Anton, and Robert H. White.
1979. Analysis of support restraint of wood-stud walls. American Society of Civil Engineers Preprint 3642. 17 p.
- Schaffer, E.L.
1980. Smoldering initiation in cellulose under prolonged low-level heating. *Fire Technology* 16(1):22-28.
- Schaffer, E.L.
1980. Temperature-time dependency of longitudinal mechanical behavior of dry douglas-fir. *In* General Constitutive Relationships for Wood and Wood-Based Materials: National Science Foundation Workshop Proceedings [Blue Mountain Lake, N.Y., July 1978]. Syracuse University. p. 234-278.
- Sherwood, G.E.
1980. Survey of existing performance requirements in codes and standards for light-frame construction. U.S. Dep. Agric. For. Serv. General Technical Report FPL-26. 22 p.
- Sherwood, G.E. and W.A. Gatz.
1979. Performance of wood in a do-it-yourself solar collector. U.S. Dep. Agric. For. Serv. Research Note FPL-0240. 6 p.
- Tuomi, R.L.
1980. Full-scale testing of wood structures. *In* Full-scale load testing of structures. W.R. Schriever, ed. American Society for Testing and Materials, ASTM Special Technical Publication 702. p. 45-62.
- White, Marshall S., and David W. Green.
1980. Effect of substrate on the fracture toughness of wood-adhesive bonds. *Wood Science* 12(3):149-153.
- White, Robert H.
1979. Oxygen index evaluation of fire-retardant-treated wood. *Wood Science* 12(2):113-121.
- White, Robert H., and E.L. Schaffer.
1979. Finite difference thermal analysis applied to charring wood. *In* Numerical Methods in Thermal Problems/ First International Conference: Conference Proceedings [Swansea, U.K., July 2-6, 1979]. p. 871-882.
- Woeste, F., and E.L. Schaffer.
1979. Second moment reliability analysis of fire exposed wood joist floor assemblies. *Fire and Materials* 3(3):126-131.
- Woeste, Frank E., Stanley K. Suddarth, and William L. Galligan.
1979. Simulation of correlated lumber properties data — a regression approach. *Wood Science* 12(2):73-79.
- Zahn, John J.
1980. Non-linear constitutive relations for wood. *In* General Constitutive Relationships for Wood and Wood-Based Materials: National Science Foundation Workshop Proceedings [Blue Mountain Lake, N.Y., July 1978]. Syracuse University. p. 212-224.

Wood Chemistry and Fiber Products

- Caulfield, D.F.
1980. Interactions at the cellulose-water interface. *In* Proceedings of the 50th Anniversary Conference, Institute of Paper Chemistry. p. 70-88.
- Chang, Hou-min, Chen-Loung Chen, and T. Kent Kirk.
1980. Chemistry of lignin degraded by white-rot fungi, chapter 11. *In* Lignin biodegradation: microbiology, chemistry, and potential applications, volume 1. CRC Press, Incorporated, Boca Raton, Fla. p. 215-230.

Products and Engineering

- Conner, Anthony H., Marilyn A. Diehl, and John W. Rowe.
1979. Tall oil precursors in three western pines: Ponderosa, lodgepole, and limber pine. *Wood Science* 12(3):183-191.
- Conner, Anthony H., Marilyn A. Diehl, and John W. Rowe.
1979. Tall oil precursors and turpentine in jack and eastern white pine. *Wood Science* 12(4):194-200.
- Conner, Anthony H., Bhimsen A. Nagasampagi, and John W. Rowe.
1980. Terpenoid and other extractives of western white pine bark. *Phytochemistry* 19:1121-1131.
- Connors, W.J., L.N. Johanson, K.V. Sarkanen, and P. Winslow.
1980. Thermal degradation of kraft lignin in tetralin. *Holzforschung* 34(1):29-37.
- Connors, William J., Simo Sarkanen, and Joseph L. McCarthy.
1980. Gel chromatography and association complexes of lignin. *Holzforschung* 34(3):80-85.
- Fenn, Patrick, and T. Kent Kirk.
1979. Ligninolytic system of *Phanerochaete chrysosporium*: Inhibition by α -phthalate. *Archives of Microbiology* 123:307-309.
- Hon, David N.-S., Geza Ifju, and William C. Feist.
1980. Characteristics of free radicals in wood. *Wood and Fiber* 12(2):121-130.
- Jeffries, T., B.S. Monteneourt, and D.E. Eveleigh.
1980. Fuels from biomass (fermentation) — U.S.A. *In* Fungal biotechnology. J.E. Smith, D.R. Berry, and B. Kristiansen, eds. Academic Press, London. p. 225-242.
- Johnson, Millard W., Jr., Thomas J. Urbanik, and William E. Denniston.
1980. Maximizing top-to-bottom compression strength. *Paperboard Packaging* 65(4):98, 100, 102-104, 106, 108.
- Karchesy, Joseph J., and Richard W. Hemingway.
1980. Loblolly pine bark polyflavanoids. *Journal of Agricultural and Food Chemistry* 28:222-228.
- Kirk, T. Kent.
1980. Studies on the physiology of lignin metabolism by white-rot fungi, chapter 4. *In* Lignin biodegradation: microbiology, chemistry, and potential applications, volume 2. CRC Press, Incorporated, Boca Raton, Fla. p. 51-63.
- Kirk, T. Kent, Takayoshi Higuchi, and Hou-min Chang.
1980. Lignin biodegradation: summary and perspectives, chapter 16. *In* Lignin biodegradation: microbiology, chemistry, and potential applications, volume 2. CRC Press, Incorporated, Boca Raton, Fla. p. 235-243.
- Klungness, J.H., and M.P. Exner.
1980. Chemical additives to pulps. Effect on drainage and strength of papers containing oak pulps. *TAPPI* 63(6):73-76.
- Kukachka, B.F.
1979. Wood anatomy of the neotropical Sapotaceae. VII. Diploen. U.S. Dep. Agric. For. Serv. Research Paper FPL-349. 4 p.
- Kukachka, B.F.
1979. Wood anatomy of the neotropical Sapotaceae. IX. Pseudoxythece. U.S. Dep. Agric. For. Serv. Research Paper FPL-350. 4 p.
- Kukachka, B.F.
1979. Wood anatomy of the neotropical Sapotaceae. X. Micropholis. U.S. Dep. Agric. For. Serv. Research Paper FPL-351. 16 p.
- Kukachka, B.F.
1979. Wood anatomy of the neotropical Sapotaceae. XI. Priurella. U.S. Dep. Agric. For. Serv. Research Paper FPL-352. 8 p.
- Kukachka, B.F.
1979. Wood anatomy of the neotropical Sapotaceae. XII. Neoxythece. U.S. Dep. Agric. For. Serv. Research Paper FPL-353. 9 p.
- Kukachka, B.F.
1979. Wood anatomy of the neotropical Sapotaceae. XIII. Pololoma. U.S. Dep. Agric. For. Serv. Research Paper FPL-354. 5 p.
- Kukachka, B.F.
1980. Wood anatomy of the neotropical Sapotaceae. XIV. Elaeoloma. U.S. Dep. Agric. For. Serv. Research Paper FPL-358. 5 p.
- Kukachka, B.F.
1980. Wood anatomy of the neotropical Sapotaceae. XV. Sandwithiodoxa. U.S. Dep. Agric. For. Serv. Research Paper FPL-359. 4 p.
- Kukachka, B.F.
1980. Wood anatomy of the neotropical Sapotaceae. XVI. Paralabatia. U.S. Dep. Agric. For. Serv. Research Paper FPL-360. 4 p.
- Kukachka, B.F.
1980. Wood anatomy of the neotropical Sapotaceae. XVII. Gambeya. U.S. Dep. Agric. For. Serv. Research Paper FPL-361. 4 p.
- Kukachka, B.F.
1980. Wood anatomy of the neotropical Sapotaceae. XVIII. Gomphiloma. U.S. Dep. Agric. For. Serv. Research Paper FPL-362. 3 p.
- Kukachka, B.F.

Landucci, Lawrence L.

1980. Quinones in alkaline pulping. Characterization of an anthrahydroquinone-quinone methide intermediate. *TAPPI* 63(7):95-99.

Lundquist, Knut, and T. Kent Kirk.

1980. Fractionation-purification of an industrial kraft lignin. *TAPPI* 63(1):80-82.

Milkovic, Jovan, George E. Myers, and Raymond A. Young.

1979. Interpretation of curing mechanism of furfuryl alcohol resins. *Cellulose Chemical Technology* 13:651-672.

Nanni, Edward J., Jr., Martin D. Stallings, and Donald T. Sawyer.

1980. Does superoxide ion oxidize catechol, α -tocopherol and ascorbic acid by direct electron transfer? *Journal of the American Chemical Society* 102: 4481-4485.

Obst, J.R., and Necmi Sanyer.

1980. Effect of quinones and amines on the cleavage rate of B-O-4 ethers in lignin during alkaline pulping. *TAPPI* 63(7):111-114.

Prellwitz, R.W.

1979. Analysis of parallel drains for highway cut-slope stabilization. *In* Transportation Research Board, National Academy of Sciences, Transportation Research Record 705. p. 2-7.

Prellwitz, R.W.

1980. Deadman anchoring guide. U.S. Dep. Agric. For. Serv. Engineering Technical Report ETR-7100-7. 35 p.

Saeman, Jerome F.

1979. Key factors in the hydrolysis of cellulose. *ACS/JCS Symposia Preprints* 24(2):472-480.

Springer, Edward L.

1979. An economic comparison of chip storage methods. *TAPPI* 62(9):39-42.

Springer, Edward L.

1979. Should whole-tree chips for fuel be dried before storage? U.S. Dep. Agric. For. Serv. Research Note FPL-0241. 5 p.

Springer, Edward L., and Kimball A. Libkie.

1980. Prehydrolysis of birch wood with sulfur dioxide. *TAPPI* 63(7):119-120.

Springer, Edward L., and Lawrence L. Zoch, Jr.

1979. Selectivity of lignin removal in a hydrotropic system: the influence of temperature and acid catalyst concentration. *Paperi ja Puu Number* 12:815-822.

Urbanik, Thomas J.

1980. Effect of transportation vibration on unitized corrugated containers. *Package Development & Systems* 10(1):13-16.

Vance, C.P., T.K. Kirk, and R.T. Sherwood.

1980. Lignification as a mechanism of disease resistance. *Annual Review of Phytopathology* 18:259-288.

Yang, H.H., M.J. Effland, and T.K. Kirk.

1980. Factors influencing fungal degradation of lignin in a representative lignocellulosic, thermomechanical pulp. *Biotechnology and Bioengineering* 22:65-77.

Zarges, R.V., Ronald D. Neuman, and John B. Crist.

1980. Kraft pulp and paper properties of *Populus* clones grown under short-rotation intensive culture. *Tappi* 63(7):91-94.

Zinkel, Duane F., and Daniel O. Foster.

1980. Tall oil precursors in the sapwood of four southern pines. *TAPPI* 63(5):137-139.

Utilization Potential and Processing of Wood

Adams, Thomas C.

1980. Logging costs for a trial of intensive residue removal. U.S. Dep. Agric. For. Serv. Research Note PNW-347. 12 p.

Adams, Thomas C.

1980. Managing logging residue under the timber sale contract. U.S. Dep. Agric. For. Serv. Research Note PNW-348. 11 p.

Araman, Philip A.

1979. To make long character-marked cuttings from low-grade yellow-poplar lumber — rip first. *International Journal of Furniture Research* 1(10):18-21.

Araman, Philip A.

1979. Standard-size blanks instead of lumber — a potential market for tropical hardwoods. *In* Proceedings Symposium on Technical and Economic Developments in the Furniture Industry. Economic Commission for Europe, Poznan, Poland, Unnumbered Monograph. 9 p.

Baker, A.J.

1980. Corrosion of metal in wood products. *In* Durability of building materials and components. American Society for Testing and Materials 1st International Conference [Ottawa, Canada, August 1978]. ASTM Special Technical Publication 691. p. 981-993.

Boone, R. Sidney, and Robert R. Maeglin.

1980. High-temperature drying of 7/4 yellow-poplar flitches for S-D-R studs. U.S. Dep. Agric. For. Serv. Research Paper FPL-365. 8 p.

Chen, Peter Y.S.

1980. Press conditions affect drying rate and shrinkage of hardwood boards. *Forest Products Journal* 30(7):43-47.

- Chen, P.Y.S., W.A. Helmer, and H.N. Rosen.
1980. Pilot plant studies of solar and solar-dehumidification lumber drying. *In* Engineering to the 21st Century. 15th Intersociety Energy Commission Engineering Conference Proceedings, volume 3. p. 2316-2323.
- Chen, Peter Y.S., and Howard N. Rosen.
1979. Drying yellow-poplar in a highly efficient solar kiln. *Proceedings Western Dry Kiln Clubs* [Coeur d'Alene, Idaho, May 10-11, 1979]. p. 23-32.
- Chen, Peter Y.S., and Edward C. Workman, Jr.
1980. Effect of steaming on some physical and chemical properties of black walnut heartwood. *Wood and Fiber* 11(4):218-227.
- Chudnoff, M., and R.L. Youngs.
1980. Evaluating concepts for improved utilization of the tropical timber resource. Presented to Committee on Forest Development in the Tropics, Fifth Session [Rome, Italy, May 21-23, 1980]. 17 p.
- Clark, Alexander, III.
1979. Suggested procedures for measuring tree biomass and reporting tree prediction equations. *In* Forest Resource Inventories, Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 615-628.
- Clark, Alexander, III, Douglas R. Phillips, and Harry C. Hitchcock, III.
1980. Predicted weights and volumes of southern red oak trees on the Highland Rim in Tennessee. U.S. Dep. Agric. For. Serv. Research Paper SE-208. 23 p.
- Crist, John B., and Bryce E. Schlaegel.
1979. Balsam poplar. U.S. Dep. Agric. For. Serv. American Woods Leaflet FS-259. 4 p.
- Duff, John E.
1980. Dimensional stability and durability of COM-PLY studs exposed to soaking, high humidity, and weathering. U.S. Dep. Agric. For. Serv. Research Paper SE-207, COM-PLY Report 18. 12 p.
- Duff, John E.
1980. Moisture conditions of a joist floor over an insulated and sealed crawl space. U.S. Dep. Agric. For. Serv. Research Paper SE-206. 5 p.
- Ebewele, Robert, Bryan River, and James Koutsky.
1979. Tapered double cantilever beam fracture tests of phenolic-wood adhesive joints. Part II. *Wood and Fiber* 11(3):197-213.
- Ebewele, Robert O., Bryan H. River, and James A. Koutsky.
1980. Tapered double cantilever beam fracture tests of phenolic-wood adhesive joints. Part II. *Wood and Fiber* 12(1):40-65.
- Emory, John.
1980. Exterior finishes on plywood composite panels. American Plywood Association, Tacoma, Wash., Research Report 140. 43 p.
- Fahey, Thomas D.
1980. Beetle-killed pine can be salvaged, but for how long? *Forest Industries* 107(5):60-61.
- Fahey, Thomas D.
1980. Grading second-growth Douglas-fir by basic tree measurements. *Journal of Forestry* 78(4):204-206.
- Feist, William C., and Edward A. Mraz.
1980. Durability of exterior natural wood finishes in the Pacific Northwest. U.S. Dep. Agric. For. Serv. Research Paper FPL-366. 8 p.
- Ferrell, Raymond S., ed.
1978. Wood: an energy source for the Southern Appalachian Highlands. *Proceedings Southern Appalachian Research/Resource Management Cooperative*. Western Carolina University, Cullowhee, N.C. 112 p.
- Frederick, Douglas J., William E. Gardner, Alexander Clark, III, and others.
1979. Biomass, nutrient, and energy estimation of mixed southern hardwoods using an area sampling technique. *In* Forest Resource Inventories, Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 782-791.
- Geimer, Robert L.
1979. Data basic to the engineering design of reconstituted flakeboard. *In* Proceedings 13th International Particleboard Symposium [Pullman, Wash.]. p. 105-125.
- Geimer, Robert L., and John B. Crist.
1980. Structural flakeboard from short-rotation, intensively cultured hybrid *Populus* clones. *Forest Products Journal* 30(6):42-48.
- Gordon, Mary, ed.
1980. Thesaurus of forest products terms for use with the AIDS/Forest Products Information Retrieval System. Forest Products Research Society, Madison, Wis. 167 p.
- Hallock, H.
1979. Log taper: effect on lumber yields and log values. *Southern Lumberman* 239(2968):96-98.
- Hallock, Hiram.
1979. The effect of log taper on lumber recovery. *In* Modern Sawmill Techniques, Proceedings 9th Sawmill Clinic, Volume 9 [Portland, Ore., March 8-9]. p. 72-78.

- anks, Leland F.
1979. Hardwood tree grading for factory lumber. *Timber Processing Industries* 4(10):43-45.
- anks, Leland F.
1980. Cubic-foot appraisal — the new kid on the block. *Northern Logger and Timber Processor* 28(11):16-17.
- anks, Leland F.
1980. Predicted cubic-foot yields of sawmill products for black cherry trees. U.S. Dep. Agric. For. Serv. Research Note NE-295. 8 p.
- art, C. Arthur.
1979. Moisture pallets: a new approach to reduce degrade in air drying. *In Proceedings Seventh Annual Hardwood Symposium*, Hardwood Research Council. p. 91-99.
- elmer, W.A., H.N. Rosen, P.Y.S. Chen, and S.S. Wang.
1980. A theoretical model for solar-dehumidification drying of wood. *In Drying '80*, Volume 2. Arun S. Mujumdar, ed. Hemisphere Publication Corporation, New York. p. 21-28.
- oward, James O.
1979. Wood for energy in the Pacific Northwest: an overview. U.S. Dep. Agric. For. Serv. General Technical Report PNW-94. 28 p.
- unt, Michael O., J. Dobbin McNatt, and David A. Fergus.
1980. Evaluation of new shear property test methods for thick particleboard. *Forest Products Journal* 30(2):39-42.
- gram, L.L., G.D. McGinnis, and W.C. Feist.
1980. Effect of selected clear finishes on the vaporization of pentachlorophenol from treated wood. Mississippi Forest Products Utilization Laboratory, Information Series Number 21. 6 p.
- ohnston, William F., and Matti J. Hyvarinen.
1979. Northern white-cedar, an American wood. U.S. Dep. Agric. For. Serv. American Woods Leaflet FS-227. 4 p.
- ung, Joseph.
1979. Stress-wave grading techniques on veneer sheets. U.S. Dep. Agric. For. Serv. General Technical Report FPL-27. 13 p.
- elly, M.W., and R.G. Pearson.
1978. Strength of selected methods for joining low-density fiberboard. *Forest Products Journal* 28(8):29-33.
- ab, Lawrence L., Felix Y. Yokel, William L. Galloian, and others.
Koch, Peter
1980. Concept for southern pine plantation operation in the year 2020. *Journal of Forestry* 78:78-82.
- Koch, Peter
1980. Increased utilization of the biomass harvested from southern pine sites — 1980 to 2020. *In TAPPI Proceedings* 1980:271.
- Koch, Peter, and Thomas E. Savage.
1980. Development of the swathe-felling mobile chipper. *Journal of Forestry* 78:17-21.
- Koenigshof, Gerald A.
1979. Economic feasibility of manufacturing COM-PLY panels in the South. U.S. Dep. Agric. For. Serv. Research Paper SE-201, COM-PLY Report 17. 28 p.
- Koenigshof, Gerald A.
1979. Status of COM-PLY floor joist research. *Forest Products Journal* 29(11): 37-42.
- Koenigshoff, Gerald A.
1980. Changes in methods of plywood manufacture that will affect future investment decisions. *The Wall Street Transcript* 68(2):58, 520 and 58, 557.
- Koenigshof, Gerald A., and Gwen A. Long.
1979. Putting a damper on basement leaks. *Builder* 3(15):34, 36.
- Kozlik, Charles J., and James C. Ward.
1979. Conventional and high-temperature kiln drying of sapwood, normal heartwood and sinker heartwood of dimension lumber from young-growth western hemlock. *In Proceedings Western Dry Kiln Clubs, 30th Annual Meeting* [Corvallis, Oreg., May 10-11]. p. 33-53.
- Lehmann, William F., and Erwin L. Schaffer.
1979. Determining optimum thickness-to-weight ratio for structural flakeboard panels. *In Proceedings 13th International Particleboard Symposium* [Pullman, Wash.]. p. 127-140.
- Lewis, D.W.
1979. Process control and automation in modern sawmills. *In Proceedings Sawmill Clinic* [Ottawa, Ontario, Canada, September 12-14]. p. 31-37.
- Lowery, David P., and Thomas R. Bohannan.
1980. Roundwood product potential in logging residue. U.S. Dep. Agric. For. Serv. Research Note INT-279. 4 p.
- Lowery, David P., and John R. Host.
1979. Preservation of dead lodoepole pine posts and poles. U.S. Dep. Agric.

- Maeglin, Robert
1979. A new look at aspen studs. *Timber Products* 11:36.
- Maeglin, Robert R.
1979. Increment cores — how to collect, handle, and use them. U.S. Dep. Agric. For. Serv. General Technical Report FPL-25. 19 p.
- Maloney, T.M., R.J. Hoyle, J.W. Talbott, and E.M. Huffaker.
1980. Analysis and design of COM-PLY panels for dimensional stability as determined by interaction between the particleboard core and veneer facing components. Phase 3. Washington State University, Pullman. Research Report 80/57-27. 33 p.
- Matteson, DeForest.
1980. Effects of outdoor and laboratory weathering on mechanical properties of plywood composite panels. American Plywood Association, Tacoma, Wash. Research Report 141. 24 p.
- McDonald, Kent A.
1979. Application of ultrasonics in the wood industry. *In Ultrasonics International Conference Proceedings* [Graz, Austria, May 15-17]. p. 360-365.
- McMillen, John M., James C. Ward, and Joseph Chern.
1979. Drying procedures for bacterially infected northern red oak lumber. U.S. Dep. Agric. For. Serv. Research Paper FPL-345. 16 p.
- McMinn, James W.
1978. Wood: an energy source for the Southern Appalachian Highlands: a summary. *In Proceedings Southern Appalachian Research/Resource Management Cooperative*. Raymond S. Ferrell, ed. Western Carolina University, Cullowhee, N.C. p. 78-83.
- McMinn, James W.
1979. Importance of wood as an urban energy source. *In Urban Wastewood Utilization: Proceedings of a Conference on Alternatives to Urban Waste Wood Disposal*. U.S. Dep. Agric. For. Serv. General Technical Report SE-16. p. 95-99.
- McNab, William H., and Joseph R. Saucier.
1980. Estimating quantities of windrowed forest residues: a management tool for increased biomass utilization. Georgia Forestry Commission, Macon, Ga. Forest Research Paper 11. 6 p.
- Millett, M.A., R.H. Gillespie, and A.J. Baker.
1980. Precision of the rate-process method for predicting durability of adhesive bonds. *In Durability of Building Materials and Components*, American Society for Testing and Materials, 1st International Conference [Ottawa, Canada, August 1978]. ASTM STP 691:913-923.
- Oviatt, Alfred E.
1980. How to buy construction lumber. University of Wisconsin Extension Publication A3035. 5 p.
- Phillips, Douglas R.
1979. Forest residue: a significant source of energy. *Southern Lumberman* 239(2967):101-103.
- Phillips, Douglas R., James G. Schroeder, and Alexander Clark, III.
1979. Predicting veneer grade yields for loblolly and slash pine trees. *Forest Products Journal* 29(12):41-47.
- Phillips, Douglas R., James G. Schroeder, and Alexander Clark, III.
1980. Reduce pine veneer losses by selecting blocks properly. *Forest Industries* 107(4):40-42.
- Plank, Marlin E.
1979. Lumber recovery from live and dead lodgepole pine in southwestern Wyoming. U.S. Dep. Agric. For. Serv. Research Note PNW-344. 15 p.
- Pong, W.Y. "Gene", and James C. Ward.
1979. The wetwood problem in the forest products industry. *In Proceedings Western Dry Kiln Clubs, 30th Annual Meeting* [Corvallis, Oreg., May 10-11]. p. 115-124.
- Rast, Everett D., and Vincent P. Chebetar, Jr.
1980. Technique for estimating yield of furniture squares and flat stock from flitchcs. U.S. Dep. Agric. For. Serv. Research Note NE-287. 4 p.
- Reynolds, Hugh W., and Charles J. Gatchell.
1979. Marketing low-grade hardwoods. *Furniture Design and Manufacturing* 51(10):88, 90, 92 and 51(11):56, 58.
- Richards, D.B., W.K. Adkins, H. Hallock, and E.H. Bulgrin.
1979. Simulation of hardwood log sawing. U.S. Dep. Agric. For. Serv. Research Paper FPL-355. 8 p.
- Richards, D.B., W.K. Adkins, H. Hallock, and E.H. Bulgrin.
1980. Lumber values from computerized simulation of hardwood log sawing. U.S. Dep. Agric. For. Serv. Research Paper FPL-356. 29 p.
- River, Bryan H., and Robert H. Gillespie.
1980. Adhesives in building construction — past, present and future. *In Today's Problems — Tomorrow's Opportunities*. Proceedings, The Adhesive and Sealant Council [Southfield, Mich., October 1979]. p. 31-42.
- Rosen, Howard N.
1979. Psychrometric relationships and equilibrium moisture content EMC of wood at temperatures above 212°F. *In Wood Moisture Content — Temperature and Humidity Relationships*, Symposium Proceedings [Virginia Polytechnical Institute and State University, Blacksburg, October 29, 1979]. Forest Products Laboratory, Madison, Wis. p. 12-22.
- Rosen, Howard N.
1980. Empirical model for characterizing wood drying curves. *Wood Science* 12(4):201-206.

- tosen, Howard N.
1980. High-temperature initial drying of wood: potential for energy recovery. *Forest Products Journal* 30(1):29-34.
- tosen, Howard N.
1980. Kiln size affects energy required to dry lumber. U.S. Dep. Agric. For. Serv. Research Note NC-256. 2 p.
- tosen, Howard N.
1980. Wood behavior during impingement drying. *In* Drying '80, volume 1, developments in drying. A.S. Mujumdar, ed. Hemisphere Publishing Corporation, New York. p. 413-421.
- tosen, Howard N., and Charles M. Micelli.
1980. End coating effects on high-temperature-dried yellow-poplar. *Forest Products Journal* 30(4):47-50.
- SAF Task Force on Forest Biomass as an Energy Source [R.L. Doub, Chm., J.S. Bethel, T.H. Ellis, and others].
1979. Forest Biomass as an energy source. *Journal of Forestry* 77:495-502.
- taucier, Joseph R.
1980. Environmental effects of harvesting energy wood. *In* Safe and clean wood energy. Georgia Institute of Technology, Atlanta. p. 2-6.
- tschultz, T.P., and M.W. Kelly.
1980. Steady-state diffusion of moisture through plywood. *Wood Science* 13 (1):14-17.
- simpson, William, and John Tschernitz.
1979. Importance of thickness variation in kiln drying red oak lumber. *In* Proceedings Western Dry Kiln Clubs, 30th Annual Meeting [Corvallis, Oreg. May 10-11]. p. 1-10.
- simpson, William T., and John L. Tschernitz.
1980. Time, costs, and energy consumption for drying red oak lumber as affected by thickness and thickness variation. *Forest Products Journal* 30(1):23-28.
- skaar, Christen, William T. Simpson, and Robert M. Honeycutt.
1980. Use of acoustic emissions to identify high levels of stress during oak lumber drying. *Forest Products Journal* 30(2):21-22.
- snell, J.A. Kendall, and James K. Brown.
1980. Handbook for predicting residue weights of Pacific Northwest conifers. U.S. Dep. Agric. For. Serv. General Technical Report PNW-103. 44 p.
- steele, Philip H., and Hiram Hallock.
1979. A mathematical model to calculate volumes of lumber and residues produced in sawmilling. U.S. Dep. Agric. For. Serv. Research Paper FPL-336. 45 p.
- stewart, Harold A.
1979. Some surfacing defects and problems related to wood moisture content. *In* Wood Moisture Content — Temperature and Humidity Relationships, Symposium Proceedings [Virginia Polytechnical Institute and State University, Blacksburg, October 29, 1979]. Forest Products Laboratory, Madison, Wis. p. 70-75.
- stewart, Harold A., and Paul D. Parks.
1980. Peripheral milling across the grain with rakes angles up to 60°. *Forest Products Journal* 30(6):54-57.
- talbott, John W., Thomas M. Maloney, E. Max Huffaker, and others.
1980. Analysis and design of COM-PLY panels for dimensional stability as determined by interaction between the particleboard core and veneer facing components. Phase I and 2. *In* Proceedings 13th International Particleboard Symposium [Pullman, Wash.]. p. 25-82.
- taras, Michael A.
1980. Aboveground biomass of Choctawhatchee sand pines in northwest Florida. U.S. Dep. Agric. For. Serv. Research Paper SE-210. 24 p.
- troxell, Harry E., Jung Lei Tang, George R. Sampson, and Harold E. Worth.
1980. Characteristics and suitability of beetle-killed pine in Colorado's front range for wood and fiber products. U.S. Dep. Agric. For. Serv. Resource Bulletin RM-2. 10 p.
- tschernitz, J.L., E.L. Schaffer, R.C. Moody, and others.
1979. Hardwood Press-Lam cross ties: processing and performance. U.S. Dep. Agric. For. Serv. Research Paper FPL-313. 24 p.
- vick, Charles B.
1980. Structural bonding of CCA-treated wood for foundation systems. *Forest Products Journal* 30(9):25-32.
- ward, James C.
1979. Bacterial infection in the living tree and its effects on the drying characteristics of wood. *In* Proceedings 22nd Annual Joint Meeting Midwest Wood Seasoning Association and Wisconsin-Michigan Seasoning Association [Madison, Wis., May 31]. p. 1-7.

Products and Engineering

Withycombe, Richard.

1980. Production opportunities in the Northern Rockies. *In* Proceedings of a Symposium presented by the U.S. Dep. Agric. For. Serv. [Kansas City, Mo. June 6-8, 1978]. U.S. Dep. Agric. For. Serv. General Technical Report WO-5. p. 184-188.

Wolter, Karl E., William J. Peters, Donald R. Roberts, and others.

1980. Process for increasing oleoresin synthesis in *Pinus* species. U.S. Patent 4,203,253.

Worth, Harold E.

1979. Utilization of wood in new and innovative ways. *In* Proceedings Renewable Resources Symposium and Workshop [November 15-17, 1979, Kansas State University, Manhattan]. p. 63-81.

Youngquist, J.A., D.S. Gromala, R.W. Jokerst, and others.

1979. Design, fabrication, testing, and installation of a Press-Lam bridge. U.S. Dep. Agric. For. Serv. Research Paper FPL-332. 20 p.

Youngs, R.L.

1979. Forest products research in the Forest Service. *Forest Products Journal* 29(10):56-60.

Youngs, R.L.

1979. What research is called for. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 2-4, 1979]. Forest Products Research Society, Madison, Wis., Proceedings P-79-24. p. 216-218.

Zerbe, John I.

1979. Wood processing, forestry, and agricultural wastes. *In* Institute of Gas Technology, New Fuels and Advances in Combustion Technologies, Symposium Proceedings [New Orleans, La., March 1979]. p. 181-192.

Zerbe, John I.

1980. Outlook for chemical wood. *In* Proceedings 1980 Agricultural Outlook Conference. U.S. Government Printing Office, Washington, D.C. p. 130-132.

Zerbe, John I.

1980. Processes change the look of wood fuel. *Wood and Wood Products*, June, p. 42-43.

Zerbe, John I.

1980. Wood and the energy crisis. *Forest Farmer Manual* (March). p. 12-15.

Zerbe, John I., and Andrew Baker.

1980. Forest resources for producing energy. *In* Bioresources for development of the renewable way of life. Alexander King and Harlan Cleveland, eds.

Zerbe, John I., Jacob L. Whitmore, Harold E. Wahlgren, and others.

1980. Forestry activities and deforestation problems in developing countries. Report to Office of Science and Technology, Development Support Bureau, Agency for International Development PASA Number AG/TAB-1080-10-78.

RESOURCE ECONOMICS

Forest Resource Evaluation

Aldrich, Robert C.

1979. Remote sensing of wildland resources: a state-of-the-art review. U.S. Dep. Agric. For. Serv. General Technical Report RM-71. 56 p.

Aldrich, Robert C.

1980. Satisfying multiresource information needs for national assessments — a challenge for remote sensing. *In* Proceedings Symposium Remote Sensing for Natural Resources — An International View of Problems, Promises and Accomplishments [University of Idaho, Moscow, September 10-14, 1979]. R.C. Heller and J. Ulliman, eds. p. 1-15.

Alig, Ralph J., Thomas J. Mills, and Robert L. Shackelford.

1980. Most soil bank plantings in the south have been retained; some need followup treatments. *Southern Journal of Applied Forestry* 1(4):60-64.

Alig, Ralph J., Thomas J. Mills, and Robert L. Shackelford.

1980. Survey of soil bank plantings shows very high retention rate. *Forest Farmer* 10(39):8-14.

Anderson, R.L., N.D. Cost, S.D. Hubbard, and others.

1980. Fusiform rust: acres of slash and loblolly pine with at least 10 percent of the trees with fusiform rust. U.S. Dep. Agric. For. Serv., Forest Insect and Disease Management Report 80-1-2. 5 p.

Barnes, Robert B.

1979. Wildlife habitat from a forest resource inventory: is it possible? 1979 Transactions of the Northeast Section, The Wildlife Society 36:151-159.

Barnes, Robert B.

1980. A procedure to develop location coordinates for sample points from inventory sampling. *Resources Evaluation Newsletter* 1(3):1-2.

- Barrett, Michael K., and Dorothy G. Felt.
1980. Forest area and timber resource statistics for the Taos-Rio Arriba Working Circle, New Mexico, 1977. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-21. 24 p.
- Barrett, Michael K., and Dorothy G. Shupe.
1979. Forest area and timber resource statistics for southwestern Utah, 1975. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-13. 24 p.
- Barrett, Michael K., and Dorothy G. Shupe.
1980. Forest area and timber resource statistics for Colfax County, New Mexico, 1976. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-18. 23 p.
- Barrett, Michael K., and Dorothy G. Shupe.
1980. Forest area and timber resource statistics for San Miguel County, New Mexico, 1975. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-17. 23 p.
- Beltz, R.C., and G.C. Keith.
1980. Electronic technology speeds forest survey. *Southern Journal of Applied Forestry* 4(3):113-116.
- Benson, Robert E., and Joyce A. Schlieter.
1980. Logging residues in principal forest types of the Northern Rocky Mountains. U.S. Dep. Agric. For. Serv. Research Paper INT-260. 14 p.
- Benson, Robert E., and Joyce A. Schlieter.
1980. Woody material in northern Rocky Mountain forests: volume, characteristics, and changes with harvesting. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 27-36.
- Bertelson, D.F.
1979. Southern pulpwood production, 1978. U.S. Dep. Agric. For. Serv. Bulletin SO-74. 21 p.
- Bertelson, D.F.
1980. Arkansas forest industries, 1977. U.S. Dep. Agric. For. Serv. Resource Bulletin SO-75. 18 p.
- Blyth, James E., and W. Brad Smith.
1980. Minnesota logging utilization factors. 1975-1976 — development, use, implications. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-48. 8 p.
- Blyth, James E., and W. Brad Smith.
1980. Pulpwood production in the Lake States (by county, 1978). *The Timber Producer* 2:26-29.
- Blyth, James E., and W. Brad Smith.
1980. Pulpwood production in the Lake States (by county, 1979). U.S. Dep. Agric. For. Serv. Research Note NC-259. 4 p.
- Blyth, James E., and Steven Wilhelm.
1980. Fuelwood production in rural Minnesota, 1975. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-47. 6 p.
- Bolsinger, Charles L.
1979. Last of the hot redcedars. *The Log* 3(8):36-37. Association of Oregon Loggers, Springfield, Oreg.
- Bolsinger, Charles L.
1979. Western redcedar — a forest resource in transition. U.S. Dep. Agric. For. Serv. Resource Bulletin PNW-85. 24 p.
- Bones, James T.
1980. Forest-land clearing and wood recovery in Maryland. U.S. Dep. Agric. For. Serv. Research Note NE-290. 6 p.
- Bones, James T.
1980. Time series analysis of monthly pulpwood use in the Northeast. U.S. Dep. Agric. For. Serv. Research Note NE-288. 4 p.
- Bones, James T., and James E. Blyth.
1979. Pulpwood production in the Northeast and North Central States in 1978. *The Northern Logger and Timber Processor* 28(5):16-17.
- Bruce, David.
1979. Effects of metrication on analyses and summaries of forest measurements. *In* Forest Resource Inventories Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 812-829.
- Burk, Thomas E., and Alan R. Ek.
1980. Application of James-Stein and Empirical Bayes procedures to simultaneous estimation problems in forest inventory. Department of Forestry Resource Staff Paper Series 10 and appendix. College of Forest Agriculture Experiment Station, Institute of Agriculture, Forestry, and Home Economics, University of Minnesota, St. Paul. 76 p.
- Considine, Thomas J., Jr.
1980. West Virginia's wonderful woodlands. *Wonderful West Virginia* 44(4):2-6.
- Cost, N.D.
1979. Ecological structure of forest vegetation. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 29-37.
- Craft, E. Paul, and John E. Baumgras.
1979. Weight and volume yields from thinning two oak-hickory stands. U.S. Dep. Agric. For. Serv. Research Paper NE-448. 7 p.

Resource Economics

- Dennis, Donald F.
1980. Increasing timber volume enhances benefits from Kentucky's forests. *Forest Farmer* 39(13):8-9, 16-17.
- Dennis, Donald F., and Thomas W. Birch.
1980. Hunting and fishing clubs as woodland managers. *Pennsylvania Game News* 21(7):42-43.
- Felt, Dorothy G.
1980. Forest area and timber resource statistics for the Bear River and Wasatch Front Working Circles, Utah, 1976-1977. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-22. 25 p.
- Felt, Dorothy G.
1980. Forest area and timber resource statistics for the Mountain Lands and Uinta Basin Working Circles, Utah, 1977-1978. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-23. 24 p.
- Gedney, Donald R.
1979. Timber supply projections in the Pacific Northwest. *In Forest Resource Inventories Workshop Proceedings, Volume I* [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 188-191.
- Gedney, Donald R., and Charles C. Van Sickle.
1979. Geographic context of forestry, chapter 23. *In Forest resource management — decision-making principles and cases*. W.B. Saunders Company: Philadelphia, London, and Toronto. p. 301-318.
- Godfrey, E. Bruce, Ervin G. Schuster, and Enoch F. Bell.
1980. Idaho's forest products industry, 1973. U.S. Dep. Agric. For. Serv. General Technical Report INT-80. 42 p.
- Hegg, Karl M.
1979. Timber resource statistics for the Tuxedni Bay inventory unit, Alaska, 1971. U.S. Dep. Agric. For. Serv. Resource Bulletin PNW-88. 43 p.
- Hegg, Karl M., and Harold Sieverding.
1979. Timber resources of the Kuskokwin flood plain and adjacent upland. U.S. Dep. Agric. For. Serv. Resource Bulletin PNW-87. 40 p.
- Hutchins, Cecil C., Jr.
1979. Pulpwood prices in the Southeast, 1978. U.S. Dep. Agric. For. Serv. Research Note SE-287. 4 p.
- Jacobi, W.R., E.B. Cowling, and N.D. Cost.
1980. Disease losses in North Carolina forests: III. Rationale and recommendations for future survey efforts. *Plant Disease* 64:579-581.
- Jacobi, W.R., E.B. Cowling, N.D. Cost, and J.P. McClure.
1980. Disease losses in North Carolina forests: I. Losses in softwoods, 1973-1974. *Plant Diseases* 64:573-575.
- Jacobi, W.R., E.B. Cowling, N.D. Cost, and J.P. McClure.
1980. Disease losses in North Carolina forests: II. Losses in hardwoods, 1973-1974. *Plant Disease* 64:576-578.
- Jakes, Pamela J., and Gerhard K. Raile.
1980. Timber resource of Minnesota's Northern Pine Unit, 1977. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-44. 54 p.
- Jakes, Pamela J., and Alexander Vasilevsky.
1980. Minnesota land ownership trends, 1962-1977. U.S. Dep. Agric. For. Serv. Research Note NC-255. 4 p.
- Jakes, Pamela J., John S. Spencer, Jr., and Burton L. Essex.
1979. Land-use change in Missouri, 1959-1972. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-40. 18 p.
- Keegan, Charles E., III.
1980. Montana's forest products industry: a descriptive analysis. Bureau of Business Economic Research, University of Montana, Missoula. 107 p.
- Keegan, Charles E., III, Randle V. White, and Theodore S. Setzer.
1979. Wyoming timber production and mill residues — 1976. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-19. 5 p.
- Kingsley, Neal P.
1980. Management of nonindustrial private forest lands: the owner's viewpoint. *In Multiple-Use Management of Forest Resources* [Proceedings of the Symposium at Clemson University, Clemson, S.C., September 17-20, 1979]. p. 204-209.
- Kingsley, Neal P.
1980. The nonindustrial forest-land owner: Who,? Where,? and Why? *Proceedings Eighth Annual Hardwood Symposium, Hardwood Research Council* [Cashiers, N.C., April 1980]. p. 13-31.
- Kingsley, Neal P., and Thomas W. Birch.
1980. The forest-land owners of Maryland. U.S. Dep. Agric. For. Serv. Resource Bulletin NE-63. 78 p.
- Knight, Herbert A.
1980. A closer look at South Carolina's hardwoods. *In Research and research dissemination to encourage hardwood management and utilization on small ownerships. Proceedings Eighth Annual Hardwood Symposium* Hardwood Research Council [Cashiers, N.C. April 1980]. p. 164-181.
- Knight, Herbert A., and Joe P. McClure.
1979. South Carolina's forests. U.S. Dep. Agric. For. Serv. Resource Bulletin SE-51. 66 p.
- Knight, Herbert A., and R.M. Sheffield.
1980. Thinning opportunities in pine plantations in the Southeast during the 1980's. *In Thinning southern pine plantations: integrating economics and*

- Kurtz, William B., Ralph J. Alig, and Thomas J. Mills.
1980. Retention and condition of agricultural conservation program conifer plantings. *Journal of Forestry* 78(5):273-276.
- Kurtz, William B., Thomas J. Mills, and Ralph J. Alig.
1980. Development of classes for evaluating the condition of agricultural conservation program conifer plantings. U.S. Dep. Agric. For. Serv. Research Note RM-388. 7 p.
- Lindell, Gary R.
1980. Forestry development in Papua New Guinea. *Journal of Forestry* 78(3): 152-155.
- Lund, H. Gyde and Hans T. Schreuder.
1980. Aggregating inventories. U.S. Dep. Agric. For. Serv. and Soil Conservation Service; U.S. Department of the Interior, Bureau of Land Management, Geological Survey, and Fish and Wildlife Service, Resource Evaluation Newsletter 4. p. 1-3.
- Martin, A. Jeff.
1980. Volume of logging residue available for harvesting in Appalachia. *In* Proceedings of the Logging Residue Conference. p. 31-32.
- MacLean, Colin D.
1979. Treatment opportunity stratification: a better base for inventory projection. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 197-201.
- MacLean, Colin D.
1980. A technique for identifying treatment opportunities from western Oregon and Washington Forest Survey plots. U.S. Dep. Agric. For. Serv. General Technical Report PNW-102. 16 p.
- MacLean, Colin D.
1980. Opportunities for silvicultural treatment in western Oregon. U.S. Dep. Agric. For. Serv. Resource Bulletin PNW-90. 36 p.
- McClure, Joe P.
1979. Multiresource inventories: a new concept for forest survey in the Southeast. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 23-28.
- McClure, Joe P.
1979. Multiresource inventories: meeting future information needs. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 67-69.
- McClure, Joe P., and Herbert A. Knight.
1979. South Carolina's forest resources at a "turning point." *In* The Turning Point [South Carolina's Forestry Association Annual Meeting, South Carolina Forestry Association, Asheville, N.C., November 1979]. p. 12-13.
- Montana Department of Natural Resources and Conservation.
1979. Timber resources of Gallatin, Park and Meagher Counties. Montana Department of Natural Research and Conservation, Forestry Division, Missoula. 70 p.
- Nevel, Robert L., Jr., and James T. Bones.
1980. Northeastern pulpwood, 1978: an annual assessment of regional timber output. U.S. Dep. Agric. For. Serv. Resource Bulletin NE-62. 27 p.
- Ostrom, Arnold J.
1980. Forest area in Minnesota, 1977. U.S. Dep. Agric. For. Serv. Research Note NC-258. 4 p.
- Oswald, Daniel D.
1979. Metrication in forest survey: the Pacific Northwest experience. *In* Forest Resource Inventories Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 808-811.
- Powell, Douglas S., and Joseph E. Barnard.
1979. Identifying regional timber management opportunities by computer. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 486-489.
- Powell, Douglas S., and Neal P. Kingsley.
1980. The forest resources of Maryland. U.S. Dep. Agric. For. Serv. Resource Bulletin NE-61. 103 p.
- Quick, T.R., and M.S. Hedlund.
1979. Forest statistics for Arkansas Delta counties. U.S. Dep. Agric. For. Serv. Resource Bulletin SO-71. 22 p.
- Quick, T.R., and M.S. Hedlund.
1979. Forest statistics for Arkansas Ouachita counties. U.S. Dep. Agric. For. Serv. Resource Bulletin SO-72. 22 p.
- Quick, T.R., and M.S. Hedlund.
1979. Forest statistics for Arkansas Ozark counties. U.S. Dep. Agric. For. Serv. Resource Bulletin SO-73. 36 p.
- Quick, T.R., and M.S. Hedlund.
1979. Forest statistics for southwest Arkansas counties. U.S. Dep. Agric. For. Serv. Resource Bulletin SO-70. 22 p.

- Rexrode, Charles O., and John E. Baumgras.
1980. Gum spots caused by cambium miners in black cherry in West Virginia. U.S. Dep. Agric. For. Serv. Research Paper NE-463. 9 p.
- Sampson, George R., David R. Betters, and Robert N. Brenner.
1980. Mountain pine beetle, timber management, and timber industry in Colorado's front range — production and marketing alternatives. U.S. Dep. Agric. For. Serv. Resource Bulletin RM-3. 8 p.
- Schallau, Con.
1979. Timber and the West Coast's future. Proceedings Coastal Forest Management Seminar. Oregon Coastal Zone Management Association and Western Environmental Trade Association. p. 1-11.
- Schuster, Ervin G., and William D. Koss.
1979. Origin and destination of Idaho timber harvest, 1967 and 1972. U.S. Dep. Agric. For. Serv., Northern Region, R1-79-24. 39 p.
- Scott, Charles T.
1979. Midcycle updating: some practical suggestions. In Forest Resource Inventories Workshop Proceedings, Volume I. [Fort Collins, Colo., July 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 362-370.
- Sheffield, Raymond.
1979. Forest statistics for South Carolina, 1978. U.S. Dep. Agric. For. Serv. Resource Bulletin SE-50. 34 p.
- Sheffield, Raymond.
1980. Forest statistics for Northwest Florida, 1979. U.S. Dep. Agric. For. Serv. Resource Bulletin SE-52. 33 p.
- Sheffield, Raymond M., and Joanne Hutchison.
1979. Forest statistics for the Southern Coastal Plain of South Carolina, 1978. U.S. Dep. Agric. For. Serv. Resource Bulletin SE-49. 33 p.
- Shupe, Dorothy G., and Michael K. Barrett.
1980. Forest area and timber resource statistics for Santa Fe County, New Mexico, 1976. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-16. 24 p.
- Smith, W.B., and Gerhard K. Raile.
1979. Application of the tree growth projection system for inventory. In Forest Research Inventories Workshop Proceedings, Volume I [Colorado State University, Fort Collins, July 23, 26, 1979]. W.E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 222-230.
- Snell, J.A. Kendall, and James K. Brown.
1980. Handbook for predicting residue weights of Pacific Northwest conifers. U.S. Dep. Agric. For. Serv. General Technical Report PNW-103. 44 p.
- Spencer, John S., Jr.
1979. Status of timber inventories in the northeastern Great Plains. In Riparian and wetland habits of the Great Plains. Proceedings 31st Annual Meeting, Forestry Committee, Great Plains Agricultural Council [Colorado State University, Fort Collins, Colo., June 18-21, 1979]. p. 37-42.
- Spencer, John S., Jr., and Arnold J. Ostrom.
1979. Timber resource of Minnesota's aspen-birch unit, 1977. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-43. 52 p.
- Timson, Floyd G.
1980. The quality and availability of hardwood logging residue based on developed quality levels. U.S. Dep. Agric. For. Serv. Research Paper NE-459. 10 p.
- Tryon, E.H., D.S. Powell, and E.J. Harner.
1980. Predicting root age of advance growth beneath hardwood canopies. Canadian Journal of Forest Research 10(3):264-268.
- Van Hees, W.W.S., and M.S. Hedlund.
1980. Arkansas hardwood resource availability and quality. In Proceedings Eighth Annual Hardwood Symposium Hardwood Research Council [Cashiers, N.C., April 1980]. p. 144-154.
- Van Sickle, Charles C.
1978. Forest resource inventory: a moving target. In Proceedings 8th World Forestry Congress [Jakarta, Indonesia]. Forest Insect and Disease I/16-11.
- Vasilevsky, Alexander, and Ronald L. Hackett.
1980. Timber resource of Minnesota's Central Hardwood Unit, 1977. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-46. 65 p.
- Welch, Richard L.
1980. Living residues in the South Atlantic States. Forest Products Journal 30(6):37-39.
- Wharton, Eric H., and James T. Bones.
1980. Trends in timber use and product recovery in Pennsylvania. 1966-1977. U.S. Dep. Agric. For. Serv. Research Note NE-297. 4 p.
- Wharton, Eric H., and Robert L. Nevel, Jr.
1979. Northeastern sawmills and lumber production over the years. The Northern Logger and Timber Processor 28(5):22-23, 38.
- White, Randle V., Charles E. Keegan, III, and Theodore S. Setzer.
1980. Montana timber production and mill residues, 1976. U.S. Dep. Agric. For. Serv. Resource Bulletin INT-20. 6 p.
- Wiant, Harry V., Jr., and Michael S. Fountain.
1980. Oak site index and biomass yield in upland oak and cove hardwood timber types in West Virginia. U.S. Dep. Agric. For. Serv. Research Note NE-291. 2 p.

Forest Economics

- Bell, Enoch F., K. Norman Johnson, Kent P. Connaughton, and Robert W. Sassaman.
1979. Roadless area — intensive management trade-offs on the Bridger-Teton and Lolo National Forests. U.S. Dep. Agric. For. Serv. General Technical Report INT-72. 38 p.
- Bowes, Michael D., and John F. Dwyer.
1980. Benefit-cost analysis in recreation: a reply to critics. *Journal of Forestry* 78(1):26-27.
- Callahan, John C., John M. Toth, and Joseph T. O'Leary.
1979. The timber marketing process in Indiana. U.S. Dep. Agric. For. Serv. Research Paper NC-177. 7 p.
- Connaughton, Kent P., and William McKillop.
1979. Estimation of "small area" multipliers for wood processing sector — an econometric approach. *Forest Science* 25(1):7-20.
- Cuppert, D.G., C.H. Moore, and E.P. Craft.
1980. Experimental and commercial drying 4/4 southern lowland red oak. *Southern Lumberman* 240(2973):8-10.
- Dennis, Donald F.
1980. Estate planning and forestry. *The Consultant* 25(2):43-45.
- de Steiguer, Joseph E., and R.G. Merrifield.
1979. The impact of the environmental era on forestry education in North America. *Unasylva* 23(123):21-25.
- Dolan, Paul C., and Jean W. Nolley.
1979. Rhode Island's secondary wood industry. Rhode Island Department of Environmental Management, Division of Forestry Environment. 22 p.
- Outrow, G.F.
1980. Economic considerations in artificial and natural regeneration of hardwoods. *Proceedings Hardwood Regeneration Symposium* [Atlanta, Ga., January 1980]. Southeastern Lumber Manufacturing Association, Forest Park, Ga. p. 48-57.
- Dwyer, John F., and David C. Baumgartner.
1979. The market for forest and associated land in southern Illinois: implications for land management. U.S. Dep. Agric. For. Serv. Research Paper NC-175. 7 p.
- Ellefson, Paul V., Sally L. Palm, and David C. Lothner.
1980. Disposal of publicly owned tax-forfeited land: a Minnesota case study. University of Minnesota, Agricultural Experiment Station Bulletin 538. 12 p.
- Fight, Roger.
1980. Multiple use reexamined. *In* *Town Meeting Forestry — issues for the 1980's*. Proceedings Society of American Foresters 1979:42-43.
- Fight, Roger D., and Robert M. Randall.
1980. Visual quality and the cost of growing timber. *Journal of Forestry* 78(9):546-548.
- Forest Industries Council, Pennsylvania Forest Productivity Committee.
1979. Pennsylvania Forest productivity report. Forest Industries Council, Pennsylvania Forest Products Commission, Washington, D.C. 8 p.
- Francis, Richard E., and Roger R. Kerbs.
1979. How to build and use a light table camera mount. U.S. Dep. Agric. For. Serv. Research Note RM-378. 2 p.
- Gansner, David A., and Owen W. Herrick.
1980. Cooperative forestry assistance in the Northeast. U.S. Dep. Agric. For. Serv. Research Paper NE-464. 8 p.
- Gibbs, Kenneth C.
1980. Public campgrounds: are they profitable? *Journal of Forestry* 78(8):466-468.
- Gibbs, Kenneth C., and Willem W. S. van Hees.
1980. A cost analysis of the U.S. Forest Service campgrounds in the Pacific Northwest. Oregon State University, Corvallis, Forestry Research Laboratory Research Bulletin 30. 14 p.
- Godfrey, E. Bruce.
1979. The wild horse laws. *Utah Science* 40(2):45-50. Utah Agricultural Experiment Station, Logan.
- Goetzl, Alberto, and William C. Siegel.
1980. Water quality laws in southern states: how they affect forestry. *Southern Journal of Applied Forestry* 4(1):2-11.
- Gove, William G., and Jean W. Nolley.
1980. Vermont's secondary wood industry. Vermont Agency of Environmental Conservation, Department of Forestry, Parks, and Recreation. 42 p.
- Granskog, James E.
1980. Labor for thinning — trends and prospects. *In* *Proceedings Southern Forest Economics Workshop: Thinning Southern Pine Plantations*;

Resource Economics

- Harpole, George B.
1979. Economic models for structural flakeboard production. *Forest Products Journal* 29(12):26-28.
- Harpole, George B.
1980. Cost of manufacturing structural flakeboard panel products. *In* American Institute of Chemical Engineers Symposium Series [Boston, Mass., June 1978]. p. 57-67.
- Hickman, Clifford A., and Ben D. Jackson.
1979. Economic impacts of controlling soil loss from silvicultural activities in East Texas. *Forest Science* 25(4):627-640.
- Ince, Peter J.
1979. Cost of grading lumber by the machine-stress-rating process. *Forest Products Journal* 29(10):80-83.
- Ince, Peter J.
1979. How to estimate recoverable heat energy in wood or bark fuels. U.S. Dep. Agric. For. Serv. General Technical Report FPL-29. 7 p.
- Ince, Peter J., and Philip H. Steele.
1980. EVALUE: a computer program for evaluating investments in forest products industries. U.S. Dep. Agric. For. Serv. General Technical Report FPL-30. 13 p.
- Kochenderfer, J.N., and G.W. Wendel.
1980. Costs and environmental impacts of harvesting timber in Appalachia with a truck-mounted crane. U.S. Dep. Agric. For. Serv. Research Paper NE-456. 9 p.
- Larson, F.R., P.F. Ffolliott, W.O. Rasmussen, and D.R. Carder.
1979. Estimating impacts of silvicultural management practices on forest ecosystems. *In* Best Management Practices for Agriculture and Silviculture [Proceedings: 1978 Cornell Agriculture Waste Management Conference, Rochester, N.Y.]. p. 281-294.
- McCurdy, Dwight R.
1979. A description of the primary wood-using industries in southern Illinois. *Illinois Business Review* 36(9):4-5.
- Miller, Richard E., and Roger D. Fight.
1979. Analyzing forest fertilization: study evaluates costs, benefits. *Forest Industries* 107(10):60-62.
- Monahan, Ralph T., and Jeffrey L. Wartluft.
1980. Prospectus: firewood manufacturing and marketing. U.S. Dep. Agric. For. Serv. Northeastern Area FR-17. 25 p.
- National Forest Products Association.
1980. The potential for increased forest productivity: the Northeast region. *In* Forest Industries Council Forest Productivity Report. National Forest Products Association, Washington, D.C. p. 11-14.
- O'Laughlin, Jay, and Paul V. Ellefson.
1979. Diversified firms entering the wood-based industry by merger: a review. Department of Forest Resources, University of Minnesota, St. Paul, Staff Paper Series Number 7. 121 p.
- O'Laughlin, Jay, and Paul V. Ellefson.
1980. Indexed bibliography on the economic structure of the wood-based industry. Department of Forest Resources, University of Minnesota, St. Paul, Staff Paper Series Number 9. 86 p.
- Olson, Scott C., and Harry L. Haney, Jr.
1980. The impact of state death taxes on the private nonindustrial forest landowner in the South. *Southern Journal of Applied Forestry* 4(2):88-94.
- Quink, Thomas F., and Jean W. Nolley.
1979. Boston's secondary wood industry. Massachusetts Department of Environmental Management, Division of Forests and Parks. 27 p.
- Randall, Robert M., Roger D. Fight, Kent R. Connaughton, and others.
1979. Roadless area-intensive management trade-offs on Pacific Northwest National Forests. U.S. Dep. Agric. For. Serv. Research Paper PNW-258. 69 p.
- Row, Clark.
1979. Improving output from nonindustrial private forests. Report of a task force of the Society of American Foresters. Washington, D.C. 11 p.
- Row, Clark.
1979. Special languages developed for simulation applications using standard modular routines. *In* Information systems — effectiveness for the user [Proceedings Eighteenth Annual Technical Symposium, National Business Standards, Gaithersburg, Md., June 21, 1979]. p. 69-73.
- Row, Clark, Paul Teese, and Terry S. Colbert.
1980. Forest Resource policy analysis and data base use concepts: three case examples. *International Journal on Policy and Information* 4(1):69-77.
- Schuler, Albert T., and Walter B. Wallin.
1979. An econometric model of the U.S. pallet market. U.S. Dep. Agric. For. Serv. Research Paper NE-449. 11 p.
- Schuler, Albert T., and Walter B. Wallin.
1980. Report on an econometric model for domestic pallet markets. *Forest Products Journal* 30(7):27-29.

- Siegel, William C.
1979. The impact of taxation on private forest ownership. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 176-182.
- Skog, Kenneth E.
1979. The economics of wood fuel use. *In* Proceedings Mid-American Wood Combustion Conference [Northwestern Michigan College, Traverse City, November 8-9, 1979]. p. 25-31.
- Spelter, Henry.
1979. Comparative in-place costs of wood and steel framing. U.S. Dep. Agric. For. Serv. Research Paper FPL-334. 41 p.
- Spencer, David, and Ronald I. Beasley.
1979. The economic and geographic impact of national forest land on counties in southern Illinois. U.S. Dep. Agric. For. Serv. Research Paper NC-172. 27 p.
- Stern, E. George.
1979. Mechanical fastening of wood: two studies at VPI & SU. Forest Products Journal 29(9):52-54.
- Sutherland, Charles F., Jr., and William C. Siegel.
1979. How gifting between spouses can reduce forest estate taxes. Journal of Forestry 77(10):655-657.
- Vaslevich, J. Michael.
1980. Costs of hazard-reduction burning on southern national forests. Southern Journal of Applied Forestry 4(1):12-15.
- Vaslevich, J. Michael.
1980. Timber stand improvement: a method for determining profitability. *In* Research and research dissemination to encourage hardwood management and utilization on small ownerships [Proceedings Eighth Annual Hardwood Symposium, Hardwood Research Council, Cashiers, N.C., April 1980]. p. 100-117.
- Wall, Brian R.
1979. Employment: wood consumption ratios for the forest products industry in subareas of Oregon and Washington, 1976. U.S. Dep. Agric. For. Serv. Research Note PNW-342. 7 p.
- Wartluft, Jeffrey L.
1979. Thrift with wood heat. Southern Lumberman 239(2964):12-13.
- White, David E.
1980. Manpower training in eastern forest industry: a review and assessment. U.S. Dep. Agric. For. Serv. Research Paper NE-453. 20 p.
- Wolf, Charles H., and Gilbert P. Dempsey.
1979. Logging work injuries in Appalachia. Southern Lumberman 239(2968): 75-82.
- Zuurig, Hans R., and Ervin G. Schuster.
1980. MVEST — a users manual, a computer program to evaluate forestry investment opportunities. Montana Forest and Conservation Experiment Station Bulletin 44. 50 p.

Supply, Demand, and Price Analysis

- Adams, Darius M., and Richard W. Haynes.
1979. Changing patterns of location and wood use characteristics in the U.S. forest products industry: projections for 1980 through 2030. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 52-60.
- Adams, Darius M., Richard W. Haynes, Thomas J. Mills, and others.
1979. Production, consumption, and prices of softwood products in North America — regional time series data, 1950-1976. Oregon State University, Corvallis, Forest Research Laboratory Research Bulletin 27. 43 p.
- Beltz, R.C.
1979. Current and projected timber resource and wood use situation in the south. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 3-5.
- Birdsey, R.A.
1980. Forest Service survey shows pulp prices climbing. Southern Pulp and Paper Manufacturers (February):78.
- Bradley, Dennis P., Eugene M. Carpenter, James A. Mattson, and others.
1980. The supply and energy potential of forest resources in northern Wisconsin and Michigan's Upper Peninsula. U.S. Dep. Agric. For. Serv. Research Paper NC-182. 20 p.
- Buongiorno, Joseph, Jieh-Jen Chow, and Robert Stone.
1979. A monthly model of the United States demand for softwood lumber imports. Forest Science 25(4):641-655.
- Corner, Sandy.
1980. Christmas trees: a bibliography (1980 supplement). American Christmas Tree Journal 24(1):38-40.
- Darr, Dave.
1979. The Japanese market for softwood logs: a status report. Wood Review 2(19):1.
- Darr, David R.
1979. World markets for timber and forest products. *In* North America's forests: gateway to opportunity. Proceedings 1978 Joint Convention of Society of American Foresters and Canadian Institute of Forestry. p. 32-37.

Resource Economics

- Darr, David R.
1980. Softwood log export policy: the key questions. *Journal of Forestry* 78(3): 138-140, and 151.
- Darr, David R., and Gary R. Lindell.
1980. Prospects for U.S. trade in timber products: the setting. *Forest Products Journal* 30(3):17-21.
- Darr, David R., and Gary R. Lindell.
1980. Prospects for U.S. trade in timber products: imports. *Forest Products Journal* 30(4):16-20.
- Darr, David R., and Gary R. Lindell.
1980. Prospects for U.S. trade in timber products: exports. *Forest Products Journal* 30(5):21-27.
- Darr, David R., and Gary R. Lindell.
1980. Prospects for U.S. trade in timber products: implications. *Forest Products Journal* 30(6):16-20.
- Dickerhoof, Edward, and Thomas C. Marcin.
1980. Wood-base panel use for construction in the United States and prospects for the 1980's. In *Proceedings United Nations Economic Commission for Europe, Symposium on Wood-based Panels in the 1980's. Economic and Technical Perspectives*, Helsinki, Finland. p. 78-81.
- Dickerhoof, Edward, Thomas C. Marcin, and Charles G. Carl.
1980. Structural composite panels: market outlook for the 1980's. *Plywood and Panel* 20(11):21-22.
- Greene, John L.
1979. The increment contract. *Southern Journal of Applied Forestry* 3(3):82-85.
- Hansen, Bruce G.
1980. Changes and challenges in the U.S. Christmas tree industry. *Christmas Trees* 8(2):4-7.
- Haynes, Richard W.
1979. A comparison of open and set-aside timber sales on National Forests in the Douglas-fir region. *Land Economics* 55(2):277-284.
- Haynes, Richard W.
1979. An evaluation of two measures of competition for National Forest timber sales. U.S. Dep. Agric. For. Serv. Research Note PNW-337. 9 p.
- Haynes, Richard W.
1980. Competition for National Forest timber in the Northern, Pacific Southwest, and Pacific Northwest Regions. U.S. Dep. Agric. For. Serv. Research Paper PNW-266. 72 p.
- Haynes, Richard W., and Darius M. Adams.
[n.d.] Impacts of RARE II on softwood prices, consumption & production in Northwest & national markets. In *Proceedings 57th Annual Washington State Forestry Conference* [Seattle, 1978]. Washington State Forestry Conference, Olympia. p. 67-73.
- Haynes, Richard W., and Darius M. Adams.
1979. Possible changes in regional forest product output and consumption during the next 50 years. *Forest Products Journal* 29(10):75-79.
- Herrick, Owen W., and David A. Gansner.
1980. Timber prices in the northern United States — 1978. U.S. Dep. Agric. For. Serv. Research Note NE-300. 6 p.
- Kallio, Edwin, and Edward H. Dickerhoof.
1979. Business and economic information available for market planning. *Forest Products Journal* 29(10):61-66.
- Lindell, Gary R.
1980. Substitution and the USDA Forest Service log export restrictions. U.S. Dep. Agric. For. Serv. Research Note PNW-355. 6 p.
- Lothner, David C., Edwin Kallio, and David T. Davis.
1979. Minnesota's tax-forfeited land; some trends in timber harvested and stumpage prices. U.S. Dep. Agric. For. Serv. Resource Bulletin NC-42. 12 p.
- Martens, David G.
1979. A brief on the furniture industry in the USA. Division of Economics and Technical Development of Furniture Industries, Timber Commerce Economics Commission for Europe, United Nations, Poznan, Poland, Unnumbered Monograph. 14 p.
- McKeever, David B.
1979. Hardboard and insulation board industries in the United States — capacity, production, and raw material requirement, 1955-1978. U.S. Dep. Agric. For. Serv. Resource Bulletin FPL-7. 12 p.
- McKeever, David B.
1980. World wood review — USA. *World Wood* 21(8):30-31.
- McKeever, David B., and H. Edward Dickerhoof.
1980. Lumber and panel products consumption for packaging and shipping in the United States — perspective for the 1980's. U.S. Dep. Agric. For. Serv. Resource Bulletin FPL-10. 8 p.
- McKeever, David B., and H. Edward Dickerhoof.
1980. United States consumption of wood-based panels for packaging and shipping — an outlook for the 1980's. In *Proceedings United Nations*

McKeever, David B., and William H. Reid.

1979. Wood products used in constructing highways in the United States. Southern Lumberman 239(2968):105-106.

Mills, Thomas J., and Ralph Alig.

1979. Projections of timber supplies for the United States: 1976-2030. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 32-38.

Oliveira, Ronald A., and Gerald W. Whittaker.

1979. An examination of dynamic relationships — and the lack thereof — among U.S. lumber prices, U.S. housing starts, U.S. log exports to Japan, and Japanese housing starts. Oregon State University, Corvallis. Agricultural Experiment Station Special Report 565. 34 p.

Phelps, Robert B.

1979. Consumption and demand for forest products in the United States. *In* Timber supply: issues and options. [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceedings P-79-24. p. 39-43.

Phelps, Robert B.

1979. Outlook for timber products. *In* 1980 Agricultural outlook. Committee print, Committee on Agriculture, Nutrition, and Forestry, United States Senate. Government Printing Office, Washington, D.C. p. 369-376.

Phelps, Robert B.

1980. Timber in the United States economy 1963, 1967, and 1972. U.S. Dep. Agric. For. Serv. General Technical Report WO-21. 90 p.

Poudel, Pramila K.

1979. Capitalization of environmental benefits into property values: literature review. U.S. Dep. Agric. For. Serv. General Technical Report RM-69. 7 p.

Reid, William H., and David B. McKeever.

1980. Wood products used in constructing conservation and development projects by the Corps of Engineers in the United States — 1962 and 1978. U.S. Dep. Agric. For. Serv. Resource Bulletin FPL-9. 12 p.

Reid, William H., and David B. McKeever.

1980. Wood products used in military construction in the United States — 1962 and 1978. U.S. Dep. Agric. For. Serv. Resource Bulletin FPL-8. 12 p.

Ruderman, Florence K.

1979. Production, prices, employment, and trade in Northwest forest industries, second quarter 1979. U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station. 55 p.

Ruderman, Florence K.

1980. Production, prices, employment, and trade in Northwest forest industries, third quarter 1979. U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station. 60 p.

Ruderman, Florence K.

1980. Production, prices, employment, and trade in Northwest forest industries, fourth quarter 1979. U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station. 55 p.

Spelter, Henry N.

1980. Trends in sawmill overruns. Forest Products Journal 30(9):21-34.

Spencer, John S., Jr., and Neal P. Kingsley.

1979. The timber supply situation in the north. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 77-87.

Stone, Robert N.

1979. Examining the midwest's wood fuel resource. *In* Proceedings Mid-American Wood Combustion Conference [Northwestern Michigan College, Traverse City, November 8-9, 1979]. p. 8-24.

Tombaugh, Larry W., and Robert N. Stone.

1980. Renewable resources: will they be scarce in the future? *In* Through the 80's, thinking globally, acting locally, World Future Society, Washington, D.C. p. 118-121.

U.S. Dep. Agric. Forest Service.

1980. An assessment of the forest and range land situation in the United States. U.S. Dep. Agric. For. Serv. FS-345. 631 p.

Van Sickle, C.C., and D.D. Van Hooser.

1979. The western forest — a resource in transition. *In* Timber Supply: Issues and Options [San Francisco, Calif., October 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 48-51.

TIMBER MANAGEMENT

Biological Relations

Antos, Joseph A., and Raymond C. Shearer.

1980. Vegetation development on disturbed grand fir sites, Swan Valley, northwestern Montana. U.S. Dep. Agric. For. Serv. Research Paper INT-251. 26 p.

Auchmoody, L.R.

1979. Nitrogen fertilization stimulates germination of dormant pin cherry seed. Canadian Journal of Forest Research 9:514-516.

Timber Management

- Auchmoody, L.R., and T. Grewling.
1979. Problems associated with chemical estimates of biomass. *In* Proceedings: Impact of Intensive Harvesting on Forest Nutrient Cycling. State University of New York, College of Environmental Science and Forestry, School of Forestry, Syracuse. p. 190-210.
- Ball, M.J., D.H. Hunter, and B.F. Swindel.
1979. Understory development in north Florida bedded slash pine plantations. Intensive Management Practices Assessment Center, Gainesville, Fla., IMPAC Reports 4(6). 12 p.
- Barger, Roland L.
1980. The forest residues utilization R&D program in brief. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 7-26.
- Barnett, James P.
1979. Alternative methods for extracting southern pine seeds. *In* Proceedings 1978 Southern Nursery Conference. U.S. Dep. Agric. For. Serv. Technical Bulletin SA-TP6. p. 119-125.
- Barnett, James P.
1979. An easy way to measure cone specific gravity. *In* Seed Collection Workshop. U.S. Dep. Agric. For. Serv. Technical Bulletin SA-TP8. p. 21-23.
- Barnett, James P.
1979. Southern pine cone maturation and storage. *In* Seed Collection Workshop. U.S. Dep. Agric. For. Serv. Technical Bulletin SA-TP8. p. 11-20.
- Barnett, James P.
1979. Storing spruce pine seeds. *Tree Planters' Notes* 38(4):20-21.
- Barnett, James P.
1980. Containerized pine seedlings for difficult sites. *In* Proceedings Reforestation of Disturbed Sites [June 1980]. Texas Agricultural Extension Service, Texas A&M University. 8 p.
- Barnett, James P.
1980. Density and age affect performance of containerized loblolly pine seedlings. U.S. Dep. Agric. For. Serv. Research Paper SO-256. 5 p.
- Barros, N.F., and W.L. Pritchett.
1979. Effect of sources and rates of nitrogen on growth and composition of *Eucalyptus grandis*. Soil and Crop Science Society of Florida. Proceedings 38:101-104.
- Benson, Robert E.
1980. Damage from logging and prescribed burning in partially cut Douglas-fir stands. U.S. Dep. Agric. For. Serv. Research Note INT-294. 6 p.
- Bey, Calvin F.
1979. Longleaf pine — a good candidate for genetic improvement. *In* Proceedings Longleaf Pine Workshop. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP3. p. 65-69.
- Blackmon, B.G., James B. Baker, and D.T. Cooper.
1979. Nutrient use by three geographic sources of eastern cottonwood. *Canadian Journal of Forest Research* 9(4):532-534.
- Bonner, F.T.
1979. Measurement of seed moisture in *Liriodendron*, *Prunus*, and *Pinus*. *Seed Science and Technology* 7:277-282.
- Bonner, F.T., and B.J. Turner.
1980. Rapid measurement of the moisture content of large seeds. *Tree Planters' Notes* 31(3):9-10.
- Boyce, S.G., ed.
1979. Biological and sociological basis for a rational use of forest resources for energy and organics. Proceedings of an International Workshop. U.S. Dep. Agric. For. Serv., Southeastern Forest Experiment Station, Asheville, N.C. 193 p.
- Boyce, S.G.
1979. Regeneration for the third forest. *Forest Farmer* 38(9):12-14.
- Boyce, Stephen G.
1979. Ecosystem dynamics for multiple-use management. *In* Multiple-use Management of Forest Resources: Proceedings Symposium. Donald D. Hook and B. Allen Dunn, eds. Clemson University, Clemson, S.C. p. 34-47.
- Boyce, S.G.
1980. Management of forest for optimal benefits (DYNAST-OB). U.S. Dep. Agric. For. Serv. Research Paper SE-204. 92 p.
- Boyce, Stephen G.
1979. Biological potential for southern timber supplies. *In* Timber Supply: Issues and Options [San Francisco, Calif. October 2-4, 1979]. Forest Products Research Society, Madison, Wis., Proceeding P-79-24. p. 153-157.
- Boyce, Stephen G.
1979. The environmental consequences of intensive forestry and the removal of whole trees from forests. *In* Biological and Sociological Basis for a Rational Use of Forest Resources for Energy and Organics: an International Workshop [East Lansing, Mich., May 1979]. Southeastern Forest Experiment Station, Asheville, N.C. p. 27-29.
- Boyce, Stephen G., and Herbert A. Knight.
1979. Prospective ingrowth of southern pine beyond 1980. U.S. Dep. Agric. For. Serv. Research Paper SE-200. 50 p.

- Boyce, Stephen G., and Herbert A. Knight.
1980. Prospective ingrowth of southern hardwoods beyond 1980. U.S. Dep. Agric. For. Serv. Research Paper SE-203. 33 p.
- Cain, M.D., and W.F. Mann, Jr.
1980. Annual brush control increases early growth of loblolly pine. Southern Journal of Applied Forestry 4:67-70.
- Campbell, Thomas E.
1980. A comparison of five tree-injected herbicides. In Proceedings Southern Weed Science Society 33:127-131.
- Cecich, Robert A.
1979. Development of vacuoles and lipid bodies in apical meristems of *Pinus banksiana*. American Journal of Botany 66(8):895-901.
- Cole, D.M., and C.E. Jensen.
1980. Estimating phloem thickness in lodgepole pine stands using electrical resistance measurements. Canadian Journal of Forest Research 10(1):102-106.
- Cole, Dennis M.
1980. Within-stand comparisons of inner bark electrical resistance in lodgepole pine — the bark moisture. Forest Science 26(2):309-312.
- Copeland, William N.
1979. Harney Lake Research Natural Area. Supplement Number 9 to "Federal Research Natural Areas in Oregon and Washington." U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station. 21 p.
- Critchfield, William B.
1980. Origins of the eastern deciduous forest. In Proceedings, Dendrology in the Eastern Deciduous Forest Biome. Virginia Polytechnic Institute and State University, School of Forestry and Wildlife Resources, Blacksburg, Va., Publication FWS-2-80. p. 1-14.
- Cromack, K., P. Sollins, W. Granstein, and others.
1979. Calcium oxalate accumulation in mats of the ectomycorrhizal fungus *Hysterangium calcium* Fisher. Soil Biology and Biochemistry 11:463-468.
- Crouch, Glenn L.
1979. Changes in the vegetation complex of a cottonwood ecosystem on the South Platte River. In Riparian and Wetland Habitats of the Great Plains: Proceedings 31st Annual Meeting [Colorado State University, Fort Collins, June 18-21, 1979]. Great Plains Agricultural Council Publication 91. p. 19-22.
- Dawson, J.O.
1979. Nitrogen fixing trees and shrubs. Illinois Research 21(4):8-9.
- Dickson, Richard E.
1979. Xylem translocation of amino acids from roots to shoots in cottonwood plants. Canadian Journal of Forest Research 9(3):374-378.
- Dyrness, C. T., and D. F. Grigal.
1979. Vegetation-soil relationships along a spruce forest transect in interior Alaska. Canadian Journal of Botany 57(23):2644-2656.
- Erdmann, Gayne G., Frederick T. Metzger, and Robert R. Oberg.
1979. Macronutrient deficiency symptoms in seedlings of four northern hardwoods. U.S. Dep. Agric. For. Serv. General Technical Report NC-53. 36 p.
- Ewel, K. C., S. J. Hood, and R. L. Myers.
1979. Simulation of the dynamics of a managed slash pine ecosystem on poorly drained soils. In Proceedings Fifth North American Forestry Biology Workshop. C. A. Hollis and A. E. Squillace, eds. School of Forest Resources and Conservation, University of Florida, Gainesville. p. 375-388.
- Franklin, J. F.
1979. Vegetation of the Douglas-fir region, chapter 4. In Forest Soils of the Douglas-fir Region. Washington State University Cooperative Extension, Pullman. p. 93-112.
- Franklin, Jerry F.
1980. Ecological site classification activities in Oregon and Washington. Forest Chronicle 56(2):68-70.
- Franklin, Jerry F., T. Maeda, Y. Ohsumi, and others.
1979. Subalpine coniferous forests of central Honshu, Japan. Ecology Monograph 49(3):311-334.
- Franklin, Jerry F., and Curt Wiberg.
1979. Goat Marsh Research Natural Area. Supplement Number 10 to "Federal Research Natural Areas in Oregon and Washington." U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station. 19 p.
- Funk, David T., Paula J. Case, W. J. Rietveld, and Robert E. Phares.
1979. Effects of juglone on the growth of coniferous seedlings. Forest Science 25(3):452-454.
- Funk, David T., Paul L. Roth, and C. K. Celmer.
1980. The influence of container type and potting medium on growth of black walnut seedlings. U.S. Dep. Agric. For. Serv. Research Note NC-253. 4 p.
- Galoch, Elzbieta, Marian Michniewicz, and Zofia Zatorska.
1979. Dynamics of endogenous auxins, cytokinins and abscisic acid-like

Timber Management

- Garrett, H. E., G. S. Cox, R. K. Dixon, and G. M. Wright.
1979. Mycorrhizae and the artificial regeneration potential of oak. *In* Regenerating Oaks in Upland Hardwood Forests [John S. Wright Forestry Conference Proceedings, Purdue University, West Lafayette, Ind., February, 1979]. p. 82-90.
- Godman, R. M., and G. A. Mattson.
1980. Low temperatures optimum for field germination of northern red oak. *Tree Planters' Notes* 31(2):32-34.
- Graber, R. E.
1980. The life history and ecology of *Potentilla robbinsiana*. *Rhodora* 82(829):131-140.
- Hacskaylo, E.
1979. Mycorrhizae: fundamental approaches to their physiology. *Allegheny News* (Winter, 1979). p. 3-4.
- Hansen, Edward A., and James B. Baker.
1979. Biomass and nutrient removal in short rotation intensively cultured plantations. *In* Proceedings Symposium on Impact of Intensive Harvesting on Forest Nutrient Cycling [State University of New York, Syracuse, August 1979]. U.S. Dep. Agric. For. Serv., Northeastern Forest Experiment Station, Broomall, Pa. p. 130-151.
- Haywood, James D.
1980. Charcoal fails to protect planted loblolly pine from soil herbicides. *Tree Planters' Notes* 31(2):14-16.
- Hebb, Edwin A.
1980. Buried organic layer affects the growth of slash pine in the Florida Sandhills. U.S. Dep. Agric. For. Serv. Research Note SE-289. 5 p.
- Hejnowicz, Z.
1980. Tensional stress in the cambium and its developmental significance. *American Journal of Botany* 67:1-5. [PL-480 Project PL-FS-64 in Katowice, Poland, in cooperation with J. A. Romberger.]
- Hoff, R. J., and G. I. McDonald.
1980. Resistance to *Cronartium ribicola* in *Pinus monticola*: reduced needle-spot frequency. *Canadian Journal of Botany* 58(5):574-577.
- Hoffman, George R., and Robert R. Alexander.
1980. Forest vegetation of the Routt National Forest, northwestern Colorado: a habitat type classification. U.S. Dep. Agric. For. Serv. Research Paper RM-221. 40 p.
- Holloway, Patricia, and John Zasada.
1979. Vegetative propagation of 11 common Alaska woody plants. U.S. Dep. Agric. For. Serv. Research Note PNW-334. 12 p.
- Hoyle, M. C.
1979. Isoelectric focusing: start-up and problem solving suggestions. *American Laboratory* 11:32-43.
- Hungerford, Roger D.
1980. Microenvironmental response to harvesting and residue management. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 37-74.
- Isebrands, J. G., and Philip R. Larson.
1980. Ontogeny of major veins in the lamina of *Populus deltoides* Bartr. *American Journal of Botany* 67(1):23-33.
- Janerette, C. A.
1979. The effects of water soaking on the germination of sugar maple seeds. *Seed Science and Technology* 7:341-346.
- Janerette, C. A.
1979. The pathway of water entry into sugar maple seeds. *Seed Science and Technology* 7:347-353.
- Jurgensen, M. F., S. F. Arno, A. E. Harvey, M. J. Larsen, and R. D. Pfister.
1979. Symbiotic and nonsymbiotic nitrogen fixation in Northern Rocky Mountain forest ecosystems. *In* Symbiotic Nitrogen Fixation in the Management of Temperate Forests [Proceedings of Workshop held at Oregon State University, Corvallis, April 2-5, 1979]. p. 294-308.
- Kallio, Edwin, and Carl H. Tubbs.
1980. Sugar maple, an American wood. U.S. Dep. Agric. For. Serv., FS-246. 5 p.
- Kaufmann, Merrill R.
1979. Stomatal control and the development of water deficit in Engelmann spruce seedlings during drought. *Canadian Journal of Forest Research* 9(3):297-304.
- Kaufmann, Merrill R.
1979. Watering: Critique I. *In* Controlled environmental guidelines for plant research. T. W. Tibbitts, and T. T. Kozlowski, eds. Academic Press Incorporated, New York. p. 291-299.
- Kormanik, Paul P.
1979. Biological means of improving nutrient uptake in trees. *In* The Ecology of Even-Aged Forest Plantations [Edinburgh, Scotland, September 1978]. E. D. Ford, D. C. Malcolm, and J. Atterson, eds. Proceedings Division 1, International Union of Forestry Research Organizations. p. 293-311.
- Kormanik, Paul P., William C. Bryan, and R. C. Schultz.
1980. Procedures and equipment for staining large numbers of plant root samples for endomycorrhizal assay. *Canadian Journal of Microbiology* 26:536-538.

- Kossuth, S. V., R. H. Biggs, and F. G. Martin.
1979. Effect of physiological age of fruit, temperature and relative humidity on absorption of ^{14}C -release by 'Valencia' oranges. *Journal of American Society of Horticultural Scientists* 104:323-327.
- Krawczynsyn, J., and J. A. Romberger.
1980. Interlocked grain, cambial domains, endogenous rhythms, and time relations, with emphasis on *Nyssa sylvatica*. *American Journal of Botany* 67:228-236.
- Krochmal, Arnold, and Connie Krochmal.
1979. Ferns of the Blue Ridge. U.S. Dep. Agric. For. Serv. General Technical Report SE-15. 15 p.
- Krochmal, Arnold, and Connie Krochmal.
1980. A checklist of common plants of the Appalachian Trail in the George Washington National Forest, Virginia. U.S. Dep. Agric. For. Serv. Research Note SE-288. 8 p.
- Kubowicz, D. B.
1979. The possible relation between cytokinins and secondary xylem formation in *Pinus silvestris*. I. Seasonal correlations. *Acta Societatis Botanicorum Poloniae* 48:295-303. [PL-480 Project PL-FS-72 in Warsaw, Poland, in cooperation with J. A. Romberger.]
- Lamson, Neil.
1980. Site index prediction tables for oak in northwestern West Virginia. U.S. Dep. Agric. For. Serv. Research Paper NE-462. 5 p.
- Larson, Philip R., J. G. Isebrands, and Richard E. Dickson.
1980. Sink to source transition of *Populus* leaves. *Berichte, Deutsche Botanische Gesellschaft* 93:79-90.
- Lea, R., and C. G. Wells.
1980. Determination of extractable sulfate and total sulfur from plant and soil material by an autoanalyzer. *Communications in Soil Science and Plant Analogy* 11:507-516.
- Leak, W. B., and Jane R. Riddle.
1979. Why trees grow where they do in New Hampshire. U.S. Dep. Agric. For. Serv., Northeastern Forest Experiment Station, NE-INF-37-79. 26 p.
- Lewis, C. E.
1980. Rock phosphate, chopping, and fire benefits forage and trees in south Florida. *Florida Cattleman* 44(9):28-29.
- Little, Elbert L., Jr.
1979. Checklist of United States trees (native and naturalized). U.S. Dep. Agric. For. Serv., Agricultural Handbook 541. 375 p.
- Mann, W. F., Jr., and L. J. Musselman.
1979. *Senna seymeria* parasitizes western conifers. *Economic Botany* 33:338-339.
- Marx, Donald H.
1979. Synthesis of ectomycorrhizae by different fungi on northern red oak seedlings. U.S. Dep. Agric. For. Serv. Research Note SE-282. 8 p.
- Marx, Donald H.
1979. Synthesis of *Pisolithus* ectomycorrhizae on pecan seedlings in fumigated soil. U.S. Dep. Agric. For. Serv. Research Note SE-283. 8 p.
- Marx, Donald H., John G. Mexal, and William G. Morris.
1979. Inoculation of nursery seedbeds with *Pisolithus tinctorius* spores mixed with hydromulch increases ectomycorrhizae and growth of loblolly pines. *Southern Journal of Applied Forestry* 3:175-178.
- McDonough, W. T.
1979. Quaking aspen — seed germination and early seedling growth. U.S. Dep. Agric. For. Serv. Research Paper INT-234. 13 p.
- McKee, William H., Jr.
1978. Slash pine seedling response to potassium and calcium on imperfectly drained coastal plain soil. *Plant and Soil* 50:615-624.
- McKee, William H., Jr.
1980. Changes in solution of forest soils with waterlogging and three levels of base saturation. *Soil Science Society of America Journal* 44:388-391.
- McNab, W. Henry, and M. Boyd Edwards.
1980. Climatic factors related to the range of saw-palmetto (*Serenoa repens* (Bartr.) Small). *The American Midland Naturalist* 103:204-208.
- Meeuwig, R. O.
1979. Growth characteristics of pinyon-juniper stands in the western Great Basin. U.S. Dep. Agric. For. Serv. Research Paper INT-238. 22 p.
- Melhuish, J. H., Jr., and E. Hacksaylo.
1980. Fatty acids of selected *Athelia* species. *Mycologia* 72:251-258.
- Minore, Don.
1979. Comparative autecological characteristics of northwestern tree species — a literature review. U.S. Dep. Agric. For. Serv. General Technical Report PNW-87. 72 p.
- Moore, W. H., and B. F. Swindel.
1979. Effects of site preparation on dry prairie vegetation in south Florida. Intensive Management Practices Assessment Center, Gainesville, Fla., IMPAC Reports 4(7). 12 p.
- Moore, W. H., and W. S. Terry.
1980. Effects of clear-cut harvest followed by site preparation on vegetation of a north Florida flatwoods site. Intensive Management Practices Assessment Center, Gainesville, Fla., IMPAC Reports 5(1). 64 p.

- Musselman, L. J., and W. F. Mann, Jr.
1979. Haustorial frequency of some root parasites in culture. *New Phytologist* 83:479-483.
- Newman, Howard C., and Wyman C. Schmidt.
1980. Silviculture and residue treatments affect water use by larch/fir forest. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 75-110.
- Pallardy, S. G., and T. T. Kozlowski.
1979. Early root and shoot growth of *Populus* clones. *Silvae Genetica* 28(4):153-156.
- Pallardy, S. G., and T. T. Kozlowski.
1979. Frequency and length of stomata of 21 *Populus* clones. *Canadian Journal of Botany* 57(22):2519-2523.
- Pawuk, W. H., J. L. Ruehle, and D. H. Marx.
1980. Fungicide drenches affect ectomycorrhizal development of container-grown *Pinus palustris* seedlings. *Canadian Journal of Forest Research* 10(1):61-64.
- Pfister, Robert D., and Stephen F. Arno.
1980. Classifying forest habitat types based on potential climax vegetation. *Forest Science* 26(1):52-70.
- Phipps, Howard M., Edward A. Hansen, and David N. Tolsted.
1980. Rooting greenwood tip cuttings of several *Populus* clones hydroponically (hydroponic rooting of *Populus* cuttings). *Canadian Journal of Forest Research* 10:107-110.
- Ponder, Felix Jr.
1979. Presence of endomycorrhizal fungi in recently graded coal mine spoil. *Journal of Soil and Water Conservation* 34(4):186-187.
- Ponder, Felix Jr.
1979. Soil structure and mycorrhizae encourage black walnut growth on old fields. U.S. Dep. Agric. For. Serv. Research Note NC-249. 4 p.
- Ponder, Felix Jr.
1980. Rabbits and grasshoppers: vectors of endomycorrhizal fungi on new coal mine spoil. U.S. Dep. Agric. For. Serv. Research Note NC-250. 2 p.
- Pope, Phillip E., and David L. Graney.
1979. Family differences influence the aboveground biomass of loblolly pine plantations. U.S. Dep. Agric. For. Serv. Research Paper SO-155. 6 p.
- Priester, David S.
1979. Stump sprouts of swamp and water tupelo produce viable seeds. *Southern Journal of Applied Forestry* 3:149-151.
- Ruehle, John L.
1980. Inoculation of containerized loblolly pine seedlings with basidiospores of *Pisolithus tinctorius*. U.S. Dep. Agric. For. Serv. Research Note SE-291. 4 p.
- Ruehle, John L., and Donald H. Marx.
1979. Fiber, food, fuel, and fungal symbionts. *Science* 206:419-422.
- Radwan, M. A., and Dean S. DeBell.
1980. Effects of different sources of fertilizer nitrogen on growth and nutrition of western hemlock seedlings. U.S. Dep. Agric. For. Serv. Research Paper PNW-267. 15 p.
- Rake, Adrian V., Jerome P. Miksche, Richard B. Hall, and Kenneth M. Hansen.
1980. DNA reassociation kinetics of four conifers. *Canadian Journal of Genetic Cytology* 22:69-79.
- Ream, Catherine H., and George E. Gruell.
1980. Influences of harvesting and residue treatments on small mammals and implications for forest management. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 455-468.
- Schmidt, Wyman C.
1980. Understory vegetation response to harvesting and residue management in a larch/fir forest. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 221-248.
- Schmitt, M. D. C., M. M. Czapowskyj, L. O. Safford, and A. L. Leaf.
1979. Biomass distribution of fertilized and unfertilized *Populus grandidentata* Michx. and *Betula papyrifera* Marsh. *In* Forest Resource Inventories Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 695-704.
- Shoulders, Eugene, and Frances V. Walker.
1979. Soil, slope, and rainfall affect height and yield in 15-year-old southern pine plantations. U.S. Dep. Agric. For. Serv. Research Paper SO-153. 52 p.
- Shoulders, Eugene, and Allan E. Tiarks.
1980. Predicting height and relative performance of major southern pines from rainfall, slope, and available soil moisture. *Forest Science* 26(3):437-447.
- Sluder, Earl.
1979. The effects of seed and seedling size on survival and growth of loblolly pine. *Tree Planters' Notes* 30(4):25-28.

- Stark, N.
1980. Light burning and the nutrient value of forage. U.S. Dep. Agric. For. Serv. Research Note INT-280. 7 p.
- Stark, Nellie.
1980. The impacts of utilization on nutrient cycling. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 123-136.
- Strong, Terry F.
1980. Energy values of nine *Populus* clones. U.S. Dep. Agric. For. Serv. Research Note NC-257. 3 p.
- Tabor, Christopher A.
1980. Microforks for transferring small organisms, organs, or tissues into culture. *In Vitro* 16:11-14.
- Teramura, A. H., S. V. Kossuth, and R. H. Biggs.
1980. Effects of varying ultraviolet-B and photosynthetically active radiation fluences on net carbon exchange, dark respiration and transpiration in soybean. *Plant Physiology* 65:483-488.
- Tinus, R. W.
1978. Root system configuration is important to long tree life. International Plant Propagation Society Proceedings 28:58-62.
- Tubbs, Carl H.
1979. Northern hardwood ecology. *In* Proceedings 1978 Joint Convention Society of American Foresters and Canadian Institute of Forestry [St. Louis, Mo.]. p. 329-333.
- Viereck, Leslie A.
1979. Characteristics of treeline plant communities in Alaska. *Holarctic Ecology* 2(4):228-238.
- Viereck, Leslie A., and C. T. Dyrness.
1980. A preliminary classification system for vegetation of Alaska. U.S. Dep. Agric. For. Serv. General Technical Report PNW-106. 38 p.
- Wallner, W. E., and R. A. Gregory.
1980. Relationship of sap sugar concentrations in sugar maple to ray tissue and parenchyma flecks caused by *Phytobia setosa*. *Canadian Journal of Forest Research* 10(3):312-315.
- Walters, Gerald A., and Donovan Goo.
1980. A new manual seeder for round seeds. *Tree Planters' Notes* 31(2):23-24.
- Wodzicki, Tomasz J., and Alina B. Wodzicki.
1980. Seasonal abscisic acid accumulation in stem cambial region of *Pinus silvestris*, and its contribution to the hypothesis of a late-wood control system in conifers. *Physiologia Plantarum* 48:443-447. [PL-480 Project PL-FS-72 in Warsaw, Poland, in cooperation with J.A. Romberger.]
- Zagórska-Marek, Beata, and Zygmunt Hejnowicz.
1980. Discontinuous lines on the radial face of wavy-grained xylem as a manifestation of morphogenic waves in the cambium. *Acta Societatis Botanicorum Poloniae* 49:49-62. [PL-480 Project PL-FS-64 in Katowice and Wrocław, Poland, in cooperation with J. A. Romberger.]
- Zobel, Donald B., and C. Robert Wasem
1979. Pyramid Lake Research Natural Area, Supplement Number 8 to "Federal Research Natural Areas in Oregon and Washington." U.S. Dep. Agric. For. Serv., Pacific Northwest Forest and Range Experiment Station. 17 p.

Silviculture

- Andrews, Duane S.
1980. Rooting western white pine, *Pinus monticola* Dougl., needle fascicles and branch cuttings. U.S. Dep. Agric. For. Serv. Research Note INT-291. 11 p.
- Baker, James B., and W. M. Broadfoot.
1980. A practical field method of site evaluation for commercially important southern hardwoods. U.S. Dep. Agric. For. Serv. General Technical Report SO-26. 51 p.
- Baker, James B., and T. A. Harrington.
1980. Arkansas research program stresses management for small landowners. *Forest Farmer* 39:6-7, 17.
- Barrett, James W.
1979. Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge. U.S. Dep. Agric. For. Serv. General Technical Report PNW-97. 106 p.
- Barse, Robert G., and Paul R. Laidly.
1980. Wood specific gravity of plantation red pine little affected by spacing. U.S. Dep. Agric. For. Serv. Research Note NC-251. 2 p.
- Belanger, R. P.
1979. Shortleaf pine. *In* Silvicultural guidelines for forest owners in Georgia. Research Division, Georgia Forestry Commission, Research Paper 6. p. 18-19.
- Berry, Charles R.
1979. Subsoiling improves growth of pine on a Georgia Piedmont site. U.S. Dep. Agric. For. Serv. Research Note SE-284. 4 p.
- Blum, Garton M., and Dale S. Solomon.
1980. Growth trends in pruned red spruce trees. U.S. Dep. Agric. For. Serv. Research Note NE-294. 6 p.

- Boldt, Charles E.
1979. Shelterwoods in Black Hills ponderosa pine. *In* Proceedings National Silviculture Workshop [Charleston, S.C., September 1979]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 178-184.
- Bonner, F. T.
1979. Fruit maturation in hardwoods. *In* Proceedings, Seed Collection Workshop. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP8. p. 6-10.
- Boyer, William D.
1979. Mortality among seed trees in longleaf pine shelterwood stands. *Southern Journal of Applied Forestry* 3:165-166.
- Boyer, William D.
1979. Natural regeneration of longleaf pine. *In* Proceedings, Longleaf Pine Workshop. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP3. p. 6-8.
- Boyer, William D.
1979. Regenerating the natural longleaf pine forest. *Journal of Forestry* 77:572-575.
- Boyer, William D.
1979. The shelterwood system for natural regeneration of longleaf pine. *In* Proceedings National Silviculture Workshop [Charleston, S.C., September 1979]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 124-128.
- Brown, Sandra, and Ariel E. Lugo.
1980. Preliminary estimate of the storage of organic carbon on tropical forest ecosystems. *In* Proceedings Symposium, The Role of Tropical Forests on the World Carbon Cycle. Center for Wetlands, University of Florida. U.S. Dep. Energy, Office of the Environment, CONF. 800-350. p. 118-139.
- Brown, Sandra, Ariel E. Lugo, and Beth Liegel, eds.
1980. Proceedings Symposium, The Role of Tropical Forests on the World Carbon Cycle. Center for Wetlands, University of Florida. U.S. Dep. Energy, Office of the Environment, CONF. 800-350.
- Burton, James D.
1980. Growth and yield in managed natural stands of loblolly and shortleaf pine in the West Gulf Coastal Plain. U.S. Dep. Agric. For. Serv. Research Paper SO-159. 23 p.
- Campbell, T. E.
1980. Direct seeded and planted loblolly and slash pine on a hardwood-dominated site yield similar 15-year results. *Southern Journal of Applied Forestry* 4:147-151.
- Clark, Paul M., and Robert D. Williams.
1979. Black walnut growth increased when interplanted with nitrogen-fixing shrubs and trees. *Indiana Academy of Science* 88(1978):88-91.
- Cochran, P. H.
1977. Forest regeneration of arid lands in the Pacific Northwest. *In* Forests for People — A Challenge in World Affairs [Proceedings Society of American Foresters 1977 National Convention]. Society of American Foresters, Washington, D.C. p. 88-91.
- Cochran, P. H.
1979. Response of thinned lodgepole pine after fertilization. U.S. Dep. Agric. For. Serv. Research Note PNW-335. 6 p.
- Cochran, P. H.
1979. Response of thinned ponderosa pine to fertilization. U.S. Dep. Agric. For. Serv. Research Note PNW-339. 8 p.
- Cordell, Charles E., and Donald H. Marx.
1979. National *Psilolithus tinctorius* ectomycorrhizae nursery evaluation results — 1978. Proceedings Intermountain Nurserymen's Association Meeting [Aspen, Colo., August 13-16]. p. 28-31.
- Cordell, Charles E., and Donald H. Marx.
1979. Results of 1978 *Psilolithus tinctorius* ectomycorrhizae national evaluation in 33 bare-root nurseries and 18 container seedling studies in the United States. *In* Proceedings Northeastern Area Nurserymen's Conference [Bloomington, Ind., July 30-August 2, 1979]. p. 52-56.
- Crow, Thomas R.
1980. A rainforest chronicle: a 30-year record of changes in structure and composition at El Verde, Puerto Rico. *Biotropica* 12(1):42-55.
- Crow, Thomas R., and David F. Grigal.
1980. A numerical analysis of arborescent communities in the rain forest of the Luquillo Mountains, Puerto Rico. *Vegetatio* 40(3):135-146.
- DeBell, Dean S.
1979. Future potential for use of symbiotic nitrogen fixation in forest management. *In* Symbiotic Nitrogen Fixation in the Management of Temperate Forests [Proceedings of a Workshop held April 2-5, 1979]. J. C. Gordon, C. T. Wheeler, and D. A. Perry, eds. Forest Research Laboratory, School of Forestry, Oregon State University, Corvallis. p. 451-466.
- Dimock, Edward J., II.
[n.d.] Cooperative animal damage survey — biological impacts and highlights. *In* Executive Summary, Proceedings 1978 Western Forestry Conference. Western Forestry and Conservation Association, Portland, Oreg. 82 p.
- Frank, Robert M.
1979. Methods for modifying stand composition to minimize the impact of spruce budworm infestations. *In* The Spruce Budworm: Silviculture and Utilization Options and Current Research Programs in Progress [Michigan Cooperative Forest Pest Management Program Workshop, Escanaba, Mich.]. Volume 79-1. 4 p.

- Gerdemann, James W., Donald H. Marx, and David Pramer.
1979. Soil microbes in plant health and nutrition. *In* Microbial processes: promising technologies for developing countries. National Academy of Sciences, Washington D.C. p. 47-58.
- Gernert, Glenn L., Arland Hofstrand, and David P. Lowery.
1980. Comparison of percent shrinkage and specific gravity for three types of western white pine wood. U.S. Dep. Agric. For. Serv. Research Note INT-276. 7 p.
- Godman, R. M.
1979. The application of shelterwood cuttings in the Lake States. *In* National Silviculture Workshop Proceedings [Charleston, S.C., September 17-21, 1979]. U.S. Dep. Agric. For. Serv., Washington, D.C. p. 189-220.
- Gottfried, Gerald J.
1980. Control of New Mexican locust and the effect on planted ponderosa pine in central Arizona. U.S. Dep. Agric. For. Serv. Research Note RM-386. 6 p.
- Graham, Russell T.
1980. White pine vigor — a new look. U.S. Dep. Agric. For. Serv. Research Paper INT-254. 15 p.
- Graham, Russell T., and Jonalea R. Tonn.
1980. Case study: growth and development of forest stands in the Northern Rocky Mountains. U.S. Dep. Agric. For. Serv. Research Paper INT-255. 24 p.
- Gratkowski, H., R. Jaszowski, and L. Armstrong.
1979. Survival of Douglas-fir seedlings sprayed with atrazine, terbacil, and 2,4-D. U.S. Dep. Agric. For. Serv. Research Paper PNW-256. 8 p.
- Harrington, Constance A., and Richard E. Miller.
1979. Response of a 110-year-old Douglas-fir stand to urea and ammonium nitrate fertilization. U.S. Dep. Agric. For. Serv. Research Note PNW-336. 7 p.
- Haywood, James D.
1980. Preparing pine planting sites with picloram pellets. *In* Proceedings Southern Weed Science Society 33:115-118.
- Hollis, C. A.
1979. Forests and water in the coastal lowlands of west Florida. *In* Forest management and water resources. University of Florida, School of Forest Resources and Conservation. Resource Report 6. p. 104-107.
- Hollis, C. A., R. F. Fisher, and W. L. Pritchett.
1978. Effects of some silvicultural practices on soil-site properties in the Lower Coastal Plains. *In* Forest Soils and Land Use [Proceedings Fifth North American Forest Soils Conference]. Chester T. Youngberg, ed. Colorado State University, Fort Collins. p. 585-606.
- Horsley, S. B.
1979. Section D. Efficacy data. *In* Information to support a special local needs registration in Pennsylvania for the use of Roundup — EPA Regulation Number 524-308 — *In* Forestry. F. S. Serdy, R. A. Conkin, and R. W. Street, eds. Monsanto Agricultural Products, St. Louis, Mo. 70 p.
- Jacobsen, Glenn L., Richard A. Thompson, and Russell A. Ryker.
1980. Effects of nitrogen and phosphorus fertilizer on planted ponderosa pine in west-central Idaho. U.S. Dep. Agric. For. Serv. Research Note INT-296. 5 p.
- Johnson, Paul S.
1979. Growth potential and field performance of planted oaks. *In* Regenerating Oaks in Upland Hardwood Forests, John S. Wright Forestry Conference Proceedings Purdue University [West Lafayette, Ind., February 1979]. p. 113-119.
- Johnson, Paul S.
1979. Shoot elongation of black oak and white oak sprouts. Canadian Journal of Forest Research 9(4):489-494.
- Johnson, Paul S.
1980. Response to fertilization of five oak species eight years after planting. Tree Planters' Notes 31(1):9-10.
- Johnson, Robert L.
1979. Timber harvests from wetlands. *In* Wetland Functions and Values: The State of Our Understanding, Proceedings National Symposium on Wetlands. Technical Publication TPS79-2. The American Water Resources Association, Minneapolis, Minn. p. 589-605.
- Johnson, R. L.
1980. New ideas about regeneration of hardwoods. *In* Proceedings Hardwood Regeneration Symposium, Southeastern Lumber Manufacturer's Association, Forest Park, Ga. p. 17-19.
- Johnston, William F.
1980. Full-tree skidding favors black spruce reproduction under certain peatland conditions. U.S. Dep. Agric. For. Serv. Research Note NC-252. 4 p.
- Jones, Earle P., Jr.
1979. Slash pine. *In* Silvicultural guidelines for forest owners in Georgia. Georgia Forestry Commission Research Paper 6. p. 6-10.
- Kandya, A. K., C. R. Venator, and E. F. Brunig.
1978. Seed and seedling characteristics in *Pinus caribaea* Mor. as geographical variation parameter; a viewpoint. Tropical Ecology 19(1):65-69.
- Kennedy, Harvey E., Jr.
1980. Coppice sycamore yields through 9 years. U.S. Dep. Agric. For. Serv. Research Note SO-254. 4 p.

Timber Management

- Kossuth, S. V., J. F. Young, J. E. Voeller, and H. A. Holt.
1980. Year-round hardwood control using the hypo-hatchet injector. *Southern Journal of Applied Forestry* 4:73-76.
- Krinard, R. M.
1979. Five years' growth of pruned and unpruned cottonwood planted at 40- by 40-foot spacing. U.S. Dep. Agric. For. Serv. Research Note SO-252. 5 p.
- Krinard, R. M., and H. E. Kennedy, Jr.
1980. Five-year-old cottonwood plantation on a clay site: growth, yield, and soil properties. *Southern Journal of Applied Forestry* 4(2):80-83.
- Langdon, O. Gordon.
1979. Natural regeneration of loblolly pine. *In Proceedings National Silviculture Workshop* [Charleston, S.C., September 1979]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 101-116.
- Leak, W. B.
1980. The influence of habitat on silvicultural prescriptions in New England. *Journal of Forestry* 78(6):329-333.
- Lewis, C. E.
1980. Some research examples of intensive management of pines and pasture. *In Southern Forest Range and Pasture Resources, Proceedings Symposium*. Winrock International. p. 221-228.
- Loftis, David L.
1979. Partial cuts to regenerate upland hardwoods in the Southeast. *In Proceedings National Silviculture Workshop* [Charleston, S.C., September 1979]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 92-100.
- Lugo, Ariel E.
1980. Are tropical forest ecosystems sources or sinks of carbon? *In Proceedings Symposium, The Role of Tropical Forests on the World Carbon Cycle*. Center for Wetlands, University of Florida. U.S. Department of Energy, Office of the Environment, CONF. 800-350. p. 1-18.
- Lugo, Ariel E., and Mark M. Brinson.
1979. Calculations on the value of salt water wetlands. *In Wetland functions and values: The state of our understanding*. American Water Resources Association, Minneapolis, Minn. p. 120-130.
- Lugo, Ariel E., and Sandra Brown.
1980. Ecological issues associated with the interpretation of atmospheric CO₂ data. *In Proceedings Symposium, The Role of Tropical Forests on the World Carbon Cycle*. Center for Wetlands, University of Florida. U.S. Department of Energy, Office of the Environment, CONF. 800-350. p. 30-43.
- Marquis, D. A.
1979. Ecological aspects of shelterwood cutting. *In Proceedings National Silviculture Workshop* [Charleston, S.C., September 1979]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 40-56.
- Marquis, D. A., and J. C. Redding.
1980. Regenerating Allegheny hardwoods. Pennsylvania State University, Cooperative Extension Service, Forest Resource 75. 4 p.
- Martin, R. E., H. E. Anderson, W. D. Boyer, and others.
1979. Effects of fire on fuels. U.S. Dep. Agric. For. Serv. General Technical Report WO-13. 64 p.
- McDonald, Gerald I., and D. S. Andrews.
1980. Influence of temperature and spore stage on production of teliospores by single aeciospore lines of *Cronartium ribicola*. U.S. Dep. Agric. For. Serv. Research Paper INT-256. 9 p.
- McGee, Charles E.
1979. Fire and other factors related to oak regeneration. *In Regenerating Oaks in the Upland Hardwood Forests*, John S. Wright Forestry Conference Proceedings [West Lafayette, Ind., February 1979]. Purdue University. p. 75-81.
- McGee, C. E., D. E. Beck, and D. H. Sims.
1979. Natural regeneration of upland hardwoods in the south. U.S. Dep. Agric. For. Serv., Southern Forest Experiment Station, New Orleans, La. [Unnumbered pamphlet.] 8 p.
- McKnight, J. S., and R. L. Johnson.
1980. Hardwood management in southern bottomlands. *Forest Farmer* [23rd Manual Edition] 39(5):30-39.
- Michael, J. L.
1980. Formulation, rate and season of application effects of hexazinone (Velpar) gridball on oak topkill. *Proceedings Southern Weed Science Society* 33:110-113.
- Michael, J. L.
1980. Long-term impact of aerial application of 2,4,5-T to longleaf pine (*Pinus palustris*). *Weed Science* 28(3):255-257.
- Michael, J. L.
1980. Response of saw palmetto to three herbicides during the first growing season. *Proceedings Southern Weed Science Society* 33:120-123.
- Miller, James H.
1980. Competition after windrowing or single-roller chopping for site preparation in the southern Piedmont. *Proceedings Southern Weed Science Society* 33:139-145.

- Miller, James H., and A. C. Bace, Jr.
1980. Streamwater contamination after aerial application of a pelletized herbicide. U.S. Dep. Agric. For. Serv. Note SO-255. 4 p.
- Miller, Richard E., and Marshall D. Murray.
1979. Fertilizer versus red alder for adding nitrogen to Douglas-fir forests of the Pacific Northwest. In *Symbiotic Nitrogen Fixation in the Management of Temperate Forests* [Proceedings of a Workshop held April 2-5, 1979]. J. C. Gordon, C. T. Wheeler, and D. A. Perry, eds. Forest Research Laboratory, School of Forestry, Oregon State University, Corvallis. p. 356-373.
- Murray, Mayo, and Robert M. VanVeldhuizen, eds.
1980. Forest regeneration at high latitudes [Proceedings of an International Workshop, Fairbanks, Alaska, November 1979]. U.S. Dep. Agric. For. Serv. General Technical Report PNW-107. 52 p.
- Myers, Joseph F., and Gilbert H. Fechner.
1980. Seed hairs and seed germination in *Populus*. *Tree Planters' Notes* 31(3):3-4.
- Oliver, William W.
1979. Early response of ponderosa pine to spacing and brush: observations on a 12-year-old plantation. U.S. Dep. Agric. For. Serv. Research Note PSW-341. 7 p.
- Packer, Paul E., and Bryan D. Williams.
1980. Logging residue disposal effects on surface hydrology and soil stability of lodgepole pine forests. In *Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests*, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 111-122.
- Perala, Donald A.
1979. Regeneration and productivity of aspen grown on repeated short rotations. U.S. Dep. Agric. For. Serv. Research Paper NC-176. 7 p.
- Perala, Donald A.
1980. A provisional assessment of triclopyr herbicide for use in Lake States forestry. U.S. Dep. Agric. For. Serv. Research Paper NC-180. 7 p.
- Radwan, M. A., John S. Shumway, and Dean S. DeBell.
1979. Effects of manganese and manganese-nitrogen applications on growth and nutrition of Douglas-fir seedlings. U.S. Dep. Agric. For. Serv. Research Paper PNW-265. 12 p.
- Rawinski, John J., James A. Bowles, and Nonan V. Noste.
1980. Soil properties related to coniferous seedling height growth in northern Wisconsin. U.S. Dep. Agric. For. Serv. Research Note NC-254. 3 p.
- Rehfeldt, G. E.
1980. Cold hardiness of western larch populations. U.S. Dep. Agric. For. Serv. Research Note INT-288. 3 p.
- Rehfeldt, Gerald E.
1979. Ecotypic differentiation in populations of *Pinus monticola* in north Idaho — myth or reality? *American Naturalist* 114(5):627-635.
- Rehfeldt, Gerald E.
1980. Ecological adaptations in Douglas-fir (*Pseudotsuga menziesii* var. *glauca*) populations. *Heredity* 43(3):383-397.
- Rehfeldt, Gerald E.
1980. Genetic variation in southern Idaho ponderosa pine progeny tests after 11 years. U.S. Dep. Agric. For. Serv. General Technical Report INT-75. 12 p.
- Reynolds, R. R.
1980. The Crossett story: The beginning of forestry in southern Arkansas and northern Louisiana. U.S. Dep. Agric. For. Serv. General Technical Report SO-32. 40 p.
- Roy, Douglass F.
1979. Shelterwood cuttings in California and Oregon. In *Proceedings, National Silviculture Workshop* [September 17-21, 1979, Charleston, S.C.]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 143-165.
- Ruehle, John L.
1980. Ectomycorrhizal colonization of container-grown northern red oak as affected by fertility. U.S. Dep. Agric. For. Serv. Research Note SE-297. 5 p.
- Running, Steven W.
1980. Environmental and physiological control of water flux through *Pinus contorta*. *Canadian Journal of Forest Research* 10(1):82-91.
- Running, Steven W.
1980. Field estimates of root and xylem resistances in *Pinus contorta* using root excision. *Journal of Experimental Botany* 31(121):555-569.
- Running, Steven W.
1980. Relating plant capacitance to the water relations of *Pinus contorta*. *Forest Ecology and Management* 2:237-252.
- Running, Steven W., and C. P. Reid.
1980. Soil temperature influences on root resistance of *Pinus contorta* seedlings. *Plant Physiology* 65:635-640.
- Ryker, Russell A.
1980. Western nursery herbicide study — 1979 update. In *Proceedings of the Intermountain Nurserymen's Association Meeting* [Aspen, Colo., August 13-16, 1979]. p. 16-23.

- Sander, Ivan L.
1979. Regenerating oaks. *In* Proceedings National Silviculture Workshop [Charleston, S.C., September, 1979]. U.S. Dep. Agric. For. Serv., Division of Timber Management, Washington, D.C. p. 212-221.
- Sander, Ivan L.
1979. Regenerating oaks with the shelterwood system. *In* Regenerating Oaks in Upland Hardwood Forests. John S. Wright Forestry Conference Proceedings, Purdue University [West Lafayette, Ind., February 1979]. p. 54-60.
- Schier, George A.
1979. Shoot development in young aspen. U.S. Dep. Agric. For. Serv. Research Note INT-275. 4 p.
- Schier, George A.
1980. Rooting stem cuttings from aspen seedlings. U.S. Dep. Agric. For. Serv. Research Note INT-282. 4 p.
- Schmidt, Wyman C., and James E. Lotan.
1980. Establishment and initial development of lodgepole pine in response to residue management. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 271-286.
- Schubert, Thomas H.
1979. Trees for urban use in Puerto Rico and the Virgin Islands. U.S. Dep. Agric. For. Serv. General Technical Report SO-27. 91 p.
- Schuster, Ervin G., and Hans R. Zuurling.
1980. Silvicultural activities of public organizations and forest industry in Montana, 1976-1978. Montana Forest and Conservation Experiment Station Research Note 14. 16 p.
- Scowcroft, Paul G.
1980. Direct sowing of treated mamane seeds: an ineffective regeneration technique. *In* Proceedings, Second Conference in Natural Sciences [Hawaii Volcanoes National Park, Hawaii, June 1-3, 1978]. University of Hawaii, Manoa. p. 247-255.
- Seidel, K. W.
1978. Managing shade tolerant vs. intolerant species. *In* R-6 Silviculture Workshop [October 1978, Colville National Forest. U.S. Dep. Agric. For. Serv., Colville National Forest, Colville, Wash. p. 177-186.
- Seidel, K. W.
1979. Natural regeneration after shelterwood cutting in a grand fir-Shasta red fir stand in central Oregon. U.S. Dep. Agric. For. Serv. Research Paper PNW-259. 23 p.
- Seidel, K. W.
1979. Regeneration in mixed conifer shelterwood cuttings in the Cascade Range of eastern Oregon. U.S. Dep. Agric. For. Serv. Research Paper PNW-264. 29 p.
- Shearer, Raymond C.
1980. Regeneration establishment in response to harvesting and residue management in a western larch — Douglas-fir forest. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 249-270.
- Smith, H. Clay.
1979. Natural regeneration and intensive cultural practices in central Appalachian hardwood stands using clearcutting and selection cutting practices. *In* Regenerating Oaks in Upland Hardwood Forests, John S. Wright Forestry Conference Proceedings [West Lafayette, Ind., February 1979]. Purdue University. p. 29-42.
- Smith, H. Clay.
1979. Release of young yellow-poplar and black cherry — 10 year results. Southern Journal of Applied Forestry 3(4):161-164.
- Smith, H. Clay, and Roger E. McCay.
1979. Estimating time required to cut grapevines in young, even-aged hardwood stands. Southern Journal of Applied Forestry 3(3):125-127.
- Steele, Robert W.
1980. Postharvest residue burning under alternative silvicultural practices. U.S. Dep. Agric. For. Serv. Research Note INT-293. 7 p.
- Steinhoff, R. J.
1980. Early growth of grand fir seedlings in northern Idaho. *In* Proceedings IUFRO Joint Meeting of Working Parties 1978, Volume Two. Province of British Columbia, Vancouver. p. 359-365.
- Stewart, R. E., A. W. Cooley, and A. Guardigli.
1979. Asulam controls western bracken (*Pteridium aquilinum*) on forest land in western Oregon. Weed Science 27(6):589-594.
- Stone, Douglas M.
1980. Survival and growth of red pine planted on a hardwood site — a second look. Forestry Chronicle 56(3):112-114.
- Stone, Douglas M., and Douglas J. Frederick.
1979. Cambial necrosis of sugar maple associated with tree marking paint. Journal of Forestry 77(9):578-580. [Also Landscape Ontario 8(1):34-36.]

- tinus, Richard W.
1979. The bedhouse: another option for nurserymen. *In* Proceedings 1978 Southern Nursery Conference [Hot Springs, Ark., July 24-27, 1978, Colonial Williamsburg, Va., August 7-10, 1978]. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP6. p. 57-68.
- tinus, R. W.
1979. Use of container-grown hardwoods for reforestation. *In* Regenerating Oaks in Upland Hardwood Forests, John S. Wright Forestry Conference Proceedings [West Lafayette, Ind., February 1979]. Purdue University. p. 120-125.
- tinus, R. W.
1980. Raising bur oak in containers in greenhouses. U.S. Dep. Agric. For. Serv. Research Note RM-384. 5 p.
- Trimble, G. R., Jr., and E. H. Tryon.
1979. Silvicultural control of wild grapevines. West Virginia University Agricultural and Forest Experiment Station Bulletin 667. 19 p.
- ubbs, Carl H.
1979. Application of shelterwood methods in some forest types of the northern Appalachian highlands of northeastern United States. National Silviculture Workshop, Charleston, S.C., Proceedings, Timber Management, U.S. Dep. Agric. For. Serv., Washington, D.C. p. 201-211.
- U.S. Department of Agriculture, Forest Service.
1979. Importance of forest site. *In* Forest practice guidelines for Tennessee. Tennessee Forestry Association. p. 4-5.
- van Haverbeke, David F.
1979. Planting in shelterbelt renovation — a rebuilding process. *In* Windbreak Management, Proceedings Workshop [October 23-25, 1979, Norfolk, Neb.]. Great Plains Agricultural Council Publication 92. p. 95-105.
- Walters, Gerald A.
1980. Bringing back the monarch of Hawaiian forests — *Acacia koa*. *In* Proceedings, Second Conference in Natural Sciences [Hawaii Volcanoes National Park, Hawaii, June 1-3, 1978]. University of Hawaii, Manoa. p. 333-336.
- Weaver, Peter L.
1980. Tree growth in several tropical forests of Puerto Rico. U.S. Dep. Agric. For. Serv. Research Paper SO-152. 15 p.
- Weaver, Peter L., and Douglas J. Pool.
1980. Correlation of crown features to growth rates in natural forests of Puerto Rico. *Turrialba* 29(1):53-58.
- Wells, Carol G., and Jacques R. Jorgensen.
1979. Effect of intensive harvesting on nutrient supply and sustained productivity. *In* Proceedings, Symposium on Impact of Intensive Harvesting on Forest Nutrient Cycling. A. L. Levy, ed. U.S. Dep. Agric. For. Serv. and U.S. Department of Energy, State University of New York, Syracuse. p. 212-230.
- Wendel, G. W.
1980. Growth and survival of planted northern red oak seedlings in West Virginia. *Southern Journal of Applied Forestry* 4(1):49-54.
- Wendel, G. W., and W. S. Gabriel.
1980. Sugar maple provenance study: West Virginia outplanting — 10-year results. U.S. Dep. Agric. For. Serv. Research Paper NE-460. 5 p.
- Zasada, John C., and David F. Grigal.
1978. The effects of silvicultural system and seed bed preparation on natural regeneration of white spruce and associated species in interior Alaska. *In* Proceedings 5th North American Forest Biology Workshop. Society of American Foresters in cooperation with School of Forest Resources and Conservation, University of Florida, and U.S. Dep. Agric. For. Serv., Southeastern Forest Experiment Station. p. 213-220.
- Zerbe, J. I., J. L. Whitmore, H. E. Wahlgren, and others.
1980. Forestry activities and deforestation problems in developing countries: report to the U.S. Department of State. U.S. Dep. Agric. For. Serv., Forest Products Laboratory. 115 p.

Management and Mensuration

- Alban, David H.
1979. How to estimate red pine site index. U.S. Dep. Agric. For. Serv. North Central Forest Experiment Station, St. Paul, Minn. 5 p.
- Alexander, Robert R., and Carleton B. Edminster.
1980. Lodgepole pine management in the central Rocky Mountains. *Journal of Forestry* 78 (4): 196-201.
- Alexander, Robert R., and Carleton B. Edminster.
1980. Management of spruce-fir in even-aged stands. U.S. Dep. Agric. For. Serv. Research Paper RM-217. 14 p.
- Amidon, Elliot L., and K. Leroy Dolph.
1979. Two cores are better than one: predicting mixed-conifer growth in the Sierra Nevada. U.S. Dep. Agric. For. Serv. Research Note PSW-340. 3 p.
- Berg, Alan B., and John F. Bell.
1979. Levels-of-growing-stock cooperative study on Douglas-fir. Report Number 5 — The Hoskins study, 1963-1975. U.S. Dep. Agric. For. Serv. Research Paper PNW-257. 29 p.

changes. Intensive Management Practices Assessment Center, Gainesville, Fla., IMPAC Reports 5(3). 28 p.

Dell, Tommy R.

1979. Potential of using crown ratio in predicting product yield. *In* Forest Resource Inventories Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 843-851.

Dolph, K. Leroy, and Elliot L. Amidon.

1979. Predicting growth of mixed-conifer species in the Sierra Nevada: rationale and methods. U.S. Dep. Agric. For. Serv. Research Note PSW-339. 7 p.

Dress, Peter E., and Richard C. Field.

1979. Multi-criterion decision methods in forest resources management. *In* Multiple-use management of forest resources. Donal D. Hook and B. Allen Dunn, eds. Clemson University, Clemson, S.C. p. 122-157.

1980. Using a computer program for determining procedures for timber harvest scheduling. *Forest Science* 26:121-133.

Foresters Council of South Carolina.

1979. South Carolina Forest Productivity Report, 1979. 20 p.

Fortson, J. C., and R. C. Field.

1979. Capital budgeting techniques for forestry: a review. *Southern Journal of Applied Forestry* 3:141-143.

Gonsior, Michael J., and James R. Ullrich.

1980. Problems and opportunities in integrating and extrapolating research results. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 497-511.

Graham, Russell T.

1980. Measuring annual growth rings using an electronic measuring device. U.S. Dep. Agric. For. Serv. Research Note INT-289. 13 p.

L
B5

B4

A3

- Hamilton, David A., Jr.
1979. Comments on application of robust regression estimating techniques in forestry. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 120-122.
- Hamilton, David A., Jr.
1979. Setting precision for resource inventories: the manager and the mensurationist. *Journal of Forestry* 77(10):667-670.
- Hann, David W., and J. Douglas Brodie.
1980. Even-aged management: basic managerial questions and available or potential techniques for answering them. U.S. Dep. Agric. For. Serv. General Technical Report INT-83. 29 p.
- Harrington, Constance A., Dean S. DeBell, and Robert F. Strand.
1979. An experiment in biomass production: results from three consecutive harvests of cottonwood and alder. *In* Proceedings of Solar 79 Northwest. U.S. Dep. Energy, City of Seattle, Bonneville Power Administration, Washington State Energy Office, and Oregon Department of Energy. p. 363-366.
- Hart, George, and Norbert V. DeByle.
1980. Environmental impacts of dispersed recreation on vegetation, soil and water. *In* Dispersed Recreation and Natural Resource Management, a Symposium. Joan Shaw, ed. College of Natural Resources, Utah State University, Logan, Utah. p. 42-46.
- Harvey, Alan E., Michael J. Larsen, and Martin F. Jurgensen.
1980. Biological implications of increasing harvest intensity on the maintenance and productivity of forest soils. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 211-220.
- Hazard, John W., and Stewart G. Pickford.
1979. Line intersect sampling of forest residue. *In* Contemporary quantitative ecology and related ecometrics. Ganapati P. Patil and Michael L. Rosenzweig, eds. Satellite Program Statistical Ecology, International Statistical Ecology Program, Statistical Ecology Series, volume 12. International Cooperative Publishing House, Burtonsville, Md. p. 493-503.
- Hilt, Donald E.
1980. Taper-based system for estimating stem volumes of upland oaks. U.S. Dep. Agric. For. Serv. Research Paper NE-458. 12 p.
- Jurgensen, Martin F., Michael J. Larsen, and Alan E. Harvey.
1980. Microbial processes associated with nitrogen cycling in northern Rocky Mountain forest soils. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 175-187.
- Kallio, Edwin, and Carl H. Tubbs.
1980. Sugar maple — an American wood. U.S. Dep. Agric. For. Serv., American Woods Leaflet FS-246. 5 p.
- Kleinschmidt, S., G. L. Baskerville, and Dale S. Solomon.
1980. Foliage weight distributions in the upper crown of balsam fir. U.S. Dep. Agric. For. Serv. Research Paper NE-455. 8 p.
- Kushmaul, R. J., M. D. Cain, C. E. Rowell, and R. L. Porterfield.
1979. Stand and site conditions related to southern pine beetle susceptibility. *Forest Science* 25:656-664.
- Laidly, Paul R.
1979. Metric site index curves for aspen, birch, and conifer in the Lake States. U.S. Dep. Agric. For. Serv. General Technical Report NC-54. 15 p.
- Larsen, Michael J., Alan E. Harvey, and Martin F. Jurgensen.
1980. Residue decay processes and associated environmental functions in northern Rocky Mountain forests. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 157-174.
- Leak, W. B.
1979. Effects of habitat on stand productivity in the White Mountains of New Hampshire. U.S. Dep. Agric. For. Serv. Research Paper NE-452. 8 p.
- Leak, W. B.
1980. Rapid economic analysis of northern hardwood stand improvement options. U.S. Dep. Agric. For. Serv. Research Note NE-296. 6 p.
- Lindquist, James L.
1979. Sprout regeneration of young-growth redwood: sampling methods compared. U.S. Dep. Agric. For. Serv. Research Note PSW-337. 8 p.
- Lloyd, J. D., Jr.
1979. 1977 Washington timber harvest. U.S. Dep. Agric. For. Serv. Resource Bulletin PNW-86. 2 p.
- Long, Garrell E.
1980. A deterministic approach to surface approximation: modeling spatially variable systems. *Ecological Modeling* 8:333-343.

- Marquis, D. A.
1980. Pennsylvania's forests: factories for the production of timber and other products. *In* The Hidden Assets of Forestry, a Seminar for Bankers. Cooperative Extension Service, Pennsylvania State University. p. 1-8.
- Max, Timothy A.
1979. Comment on "Application of robust regression estimation techniques in forestry." *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 123-126.
- McMinn, James W.
1980. Total forest concept in multi-resource management. *Journal of Forestry* 78:208-210.
- Meeuwig, Richard O., Elwood L. Miller, and Jerry D. Budy.
1979. Estimating pinyon and juniper fuel and biomass from aerial photographs. U.S. Dep. Agric. For. Serv. Research Note INT-274. 9 p.
- Monserud, Robert A.
1979. Relations between inside and outside bark diameter at breast height for Douglas-fir in northern Idaho and northwestern Montana. U.S. Dep. Agric. For. Serv. Research Note INT-266. 8 p.
- Murphy, Paul A., and Herbert S. Sternitzke.
1979. Growth and yield estimation for loblolly pine in the West Gulf. U.S. Dep. Agric. For. Serv. Research Paper SO-154. 8 p.
- Oliver, William W.
1979. Fifteen-year growth patterns after thinning a ponderosa-Jeffrey pine plantation in northeastern California. U.S. Dep. Agric. For. Serv. Research Paper PSW-141. 10 p.
- Oliver, William W.
1979. Growth of planted ponderosa pine thinned to different stocking levels in northern California. U.S. Dep. Agric. For. Serv. Research Paper PSW-147. 11 p.
- Ponder, Felix, Jr., Robert E. Phares, and Richard C. Schlesinger.
1979. Seasonal variation in foliar composition of black walnut trees. *Communications in Soil Science and Plant Analysis* 10(12):1513-1521.
- Ponder, Felix, Jr., Richard C. Schlesinger, and David T. Funk.
1980. Autumn-olive stimulates growth of black walnut. *Southern Lumberman* 240(2970):14-16.
- Rockwood, D. L., L. F. Conde, and R. H. Brendemuehl.
1980. Biomass production of closely spaced Choctawhatchee sand pines. U.S. Dep. Agric. For. Serv. Research Note SE-293. 6 p.
- Ross, E. W.
1980. Nonindustrial forest land owners in the Southeast. *In* Proceedings Eighth Annual Hardwood Symposium Hardwood Research Council [Cashiers, N.C., April 1980]. p. 32-40.
- Ruth, Robert H., and A. S. Harris.
1979. Management of western hemlock-Sitka spruce forests for timber production. U.S. Dep. Agric. For. Serv. General Technical Report PNW-88. 197 p.
- Shepperd, Wayne D.
1980. Hand-held calculator programs for the field forester. U.S. Dep. Agric. For. Serv. General Technical Report RM-76. 17 p.
- Shortle, Walter C., J. Abusamra, F. M. Laing, and M. F. Morselli.
1979. Electrical resistance as a guide to thinning sugar maples. *Canadian Journal of Forest Research* 9:436-437.
- Smyly, W. B., and T. H. Filer, Jr.
1979. Selective herbicides reduce weeding costs in two Mississippi nurseries. *In* Proceedings 1978 Southern Nursery Conference. U.S. Dep. Agric. For. Serv. Technical Publication SA-TP6. p. 131-137.
- Solomon, Dale S.
1979. Permanent plots in forestry research. *In* Forest Resource Inventories Workshop Proceedings, Volume I [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 1-6.
- Somers, Greg L., Richard G. Oderwald, William R. Harms, and O. Gordon Langdon.
1980. Predicting mortality with a Weibull distribution. *Forest Science* 26:291-300.
- Stage, Albert R., Richard K. Babcock, and William R. Wykoff.
1980. Stand-oriented inventory and growth projection: methods improve harvest scheduling on Bitterroot National Forest. *Journal of Forestry* 78(5):265-267, 278.
- Trimble, G. R., Jr.
1980. Management of stand factors affecting residue in the woods. *In* Logging Residue Conference Proceedings, 1975 [Morgantown, W. Va.]. p. 13-14.
- USDA Forest Service.
1980. Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. 526 p.
- Van Duesen, James L.
1979. Windbreak inventories. *In* Windbreak Management, Proceedings Workshop [October 23-25, 1979, Norfolk, Neb.]. Great Plains Agricultural Publication 92. p. 11-18.

Walters, Gerald A.

1980. *Saligna eucalyptus* growth in a 15-year-old spacing study in Hawaii. U.S. Dep. Agric. For. Serv. Research Paper PSW-151. 6 p.

Walters, Gerald A., and Howard Horiuchi.

1979. Containerized seedlings: key to forestation in Hawaii. *In* Proceedings Intermountain Nurserymen's Association Meeting [Aspen, Colo., August 13-16, 1979]. p. 1-6.

Ware, K. D.

1979. Statistical aspects in sampling for biomass inventory. *In* Forest Resource Inventories Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 745-756.

White, E. H., and A. E. Harvey.

1980. Modification of intensive management practices to protect forest nutrient cycles. *In* Impact of Intensive Harvesting on Forest Nutrient Cycling [Proceedings Symposium, Syracuse University of New York, Syracuse, August 1979]. p. 264-278.

Wick, Richard T., Chuck Seeley, Earl Salmonson, and Darrell L. Kenops.

1980. Implications for resource management: a panel review. *In* Environmental Consequences of Timber Harvesting in Rocky Mountain Coniferous Forests, Symposium Proceedings [September 11-13, 1979, Missoula, Mont.]. U.S. Dep. Agric. For. Serv. General Technical Report INT-90. p. 515-524.

Genetics and Tree Improvement

Bey, Calvin F.

1979. Geographic variation in *Juglans nigra* in midwestern United States. *Silvae Genetica* 28(4): 132-135.

Bramlett, David L., and Claude H. O'Gwynn.

1980. Recognizing developmental stages in southern pine flowers. U.S. Dep. Agric. For. Serv. General Technical Report SE-18. 14 p.

Bridgwater, F. E., and R. W. Stonecypher.

1979. Index selection for volume and straightness in a loblolly pine population. Proceedings 15th Southern Forest Tree Improvement Conference, Mississippi State University. p. 132-139.

Campbell, Robert K.

1979. Genecology of Douglas-fir in a watershed in the Oregon Cascades. *Ecology* 60(5):1036-1050.

Campbell, Robert K., and Albert I. Sugano.

1979. Genecology of bud-burst phenology in Douglas-fir: response to flushing temperature and chilling. *Botanical Gazette* 140(2):223-231.

Clausen, Knud E.

1980. Yield and quality from yellow birch progenies. U.S. Dep. Agric. For. Serv. Research Paper NC-183. 5 p.

Clausen, Knud E., Calvin F. Bey, and Fan H. Kung.

1979. Early growth of white ash diploids and polyploids. *In* Proceedings First North Central Tree Improvement Conference [Madison, Wis., August 21-23, 1979]. p. 86-90.

Copes, Donald L.

1980. Effect of rootstock vigor on leader elongation, branch growth, and plagiotropism in 4- and 8-year old Douglas-fir grafts. *Tree Planters' Notes* 31(1):11-14.

Critchfield, W. B.

1980. The distribution, genetics, and silvics of lodgepole pine. *In* Proceedings of the IUFRO (International Union of Forestry Research Organizations) Joint Meeting of Working Parties [Vancouver, B.C., Canada, 1978]. B.C. Ministry of Forests, Victoria. Volume I. p. 65-94.

Deneke, Frederick J., David T. Funk, and Calvin Bey.

1980. Preliminary seed collection zones for black walnut. U.S. Dep. Agric. For. Serv., NA-FB/M-4. 5 p.

Drew, A. P., and F. T. Ledig.

1980. Episodic growth and relative shoot:root balance in loblolly pine seedlings. *Annals of Botany* 45:143-148.

Franklin, E. C.

1979. Three faces of Southern forestry. High hopes for native pines. *American Forests* 85(10):24-27.

Franklin, E. C.

1980. An expanded concept of the role of forest industry in private nonindustrial forestry. Proceedings Annual Technical Association of the Pulp and Paper Industry Meeting [Atlanta, Ga., March 1980]. p. 339-342.

Funk, David T.

1980. *Alnus glutinosa* provenance trials on Ohio strip mines: sixteen-year results. *In* Proceedings First North Central Tree Improvement Conference [Madison, Wis., August 21-23, 1979]. p. 28-32.

Funk, David T., and J. J. Jokela.

1980. Eastern white pine provenance tests in Illinois: twenty-year plantation performance. *In* Proceedings First North Central Tree Improvement Conference [Madison, Wis., August 21-23, 1979]. p. 54-58.

Gabriel, William J.

1979. Early flowering and seed production in plantations of sugar maple. *Tree Planters' Notes* 30(3):11-13.

- Gabriel, William J.
1980. Trees for future sugarbushes. *Cuttings* 40(1):15.
- Haissig, Bruce E.
1979. Influence of aryl esters of indole-3-acetic and indole-3-butyric acids on adventitious root premordium initiation and development. *Physiologia Plantarum* 47:29-33.
- Haissig, Bruce E., and Richard E. Dickson.
1979. Starch measurement in plant tissue using enzymatic hydrolysis. *Physiologia Plantarum* 47:151-157.
- Hoff, Raymond J., and Gerald I. McDonald.
1980. Improving rust-resistant strains of inland western white pine. U.S. Dep. Agric. For. Serv. Research Paper INT-245. 13 p.
- Hoff, R. J., and R. J. Steinhoff.
1980. Comparative growth rates of western white pine varieties resistant to blister rust. U.S. Dep. Agric. For. Serv. Research Note INT-290. 5 p.
- Jeffers, Richard M., and Raymond A. Jensen.
1980. Twenty-year results of the Lake States jack pine seed source study. U.S. Dep. Agric. For. Serv. Research Paper NC-181. 20 p.
- Jensen, Chester E.
1979. $e - K$, a function for the modeler. U.S. Dep. Agric. For. Serv. Research Paper INT-240. 9 p.
- Kang, Hyun.
1980. The genetics of self-reproducing marbles. *In* Proceedings First North Central Tree Improvement Conference [Madison, Wis., August 21-23, 1979]. p. 133-141.
- Kang, H., and G. Namkoong.
1979. Limits of artificial selection under balanced mating systems. *Silvae Genetica* 28:53-60.
- King, James P., and Stanley L. Krugman.
1980. Tests of 36 *Eucalyptus* species in Northern California. U.S. Dep. Agric. Research Paper PSW-152. 6 p.
- Kinloch, Bohun B.
1980. Effect of photoperiod and container size on sugar pine seedling growth and infection by white blister rust. U.S. Dep. Agric. For. Serv. Research Note PSW-343. 4 p.
- Kossuth, S. V., and R. H. Biggs.
1980. The genetics of high gum yielding pines. *Naval Stores Review* 90:6-7.
- Kung, Fan H., and Knud E. Clausen.
1980. Height growth of white ash in four plantations. *In* School of Agriculture, Southern Illinois University, Carbondale. AG Revision. p. 56-60.
- Kung, F. H., and D. T. Funk.
1980. Reconstruction of entire data sets for plots that have been previously thinned to a diameter limit. *In* Forest Resources Inventories Workshop Proceedings, Volume II [Fort Collins, Colo., July 1979]. W. E. Frayer, ed. Department of Forest and Wood Sciences, Colorado State University, Fort Collins. p. 896-905.
- Ledig, F. Thomas.
1979. Energy efficient systems for biomass production. *In* Chemical Congress ACS/CST. Preprints of Symposia, Biomass as a Nonfossil Fuel Source 24(2):408-413. American Chemical Society, Honolulu, Hawaii.
- Little, Silas, and I. Frederick Trew.
1979. Pitch x loblolly pine hybrids: loblollies for the North? *Journal of Forestry* 77(11):709-713.
- Namkoong, Gene.
1979. Genotype by environment interaction: some theoretical considerations. *In* Proceedings Fifth North American Forestry Biology Workshop. Charles A. Hollis and Anthony E. Squillace, compilers and eds. University of Florida School of Forest Resources and Conservation, Gainesville [March 1978]. p. 35-45.
- Namkoong, Gene.
1980. Genetic considerations in the management of rare and local tree populations. *In* Proceedings Dendrology in the Eastern Deciduous Forest Biometrics. P. P. Feret and T. L. Sharik, eds., School of Forestry and Wildlife Resources, Virginia Polytechnic Institute and State University, Publication FWS-2-80. p. 59-65.
- Namkoong, G., R. D. Barnes, and J. Burley.
1980. A philosophy of breeding strategy for tropical forest trees. Unit of Tropical Silviculture, Commonwealth Forestry Institute, University of Oxford, Tropical Forestry Paper 16. 67 p.
- Namkoong, G., R. D. Barnes, and J. Burley.
1980. Screening for yield in forest tree breeding. *Commonwealth Forestry Review* 59:61-68.
- Nelson, Neil D., Thomas Burk, J. G. Isebrands, and Alan R. Ek.
1979. Clone and spacing effects on branch characteristics of short-rotation intensively-cultured *Populus*. *In* Proceedings First North Central Tree Improvement Conference [Madison, Wis., August 21-23, 1979]. p. 74-85.
- Nelson, Neil D., J. G. Isebrands, and Willis J. Rietveld.
1980. Ethylene loss from the gas phase of container-seal systems. *Physiologia Plantarum* 48:509-511.
- Nelson, S. O., S. L. Krugman, L. E. Stetson, and others.
1980. Germination responses of pine seed to radiofrequency, infrared, and gas-plasma-radiation treatments. *Forest Science* 26(3):377-388.

- lienstaedt, Hans.
1980. Provenance testing and provenance test results. *In* Tree Improvement Short Course for Field Foresters [Hill City, Minn., June 11-15, 1979]. U.S. Dep. Agric. For. Serv., Northeastern Area, State and Private Forestry, Broomall, Pa. p. 28-39.
- lienstaedt, Hans.
1980. Seed zoning and certification. *In* Tree Improvement Short Course for Field Foresters [Hill City, Minn., June 11-15, 1979]. U.S. Dep. Agric. For. Serv., Northeastern Area, State and Private Forestry, Broomall, Pa. p. 40-52.
- Rehfeldt, G. E., R. C. Hamilton, and S. P. Wells.
1980. Genetic gains from mass selection in lodgepole pine. U.S. Dep. Agric. For. Serv. Research Note INT-283. 6 p.
- Riemenschneider, Don E.
1980. Principles of selection. *In* Tree Improvement Short Course for Field Foresters [Hill City, Minn., June 11-15, 1979]. U.S. Dep. Agric. For. Serv., Northeastern Area, State and Private Forestry, Broomall, Pa. p. 63-80.
- Rudolph, Thomas D., and Robert A. Cecich.
1980. Provenance and plantation location variation in jack pine seed yield and quality. *In* Proceedings First North Central Tree Improvement Conference [Madison, Wis., August 21-23, 1979]. p. 10-20.
- Samtun, Frank S., Jr., Peter W. Garrett, and David B. Paterson.
1980. Oak provenance research: the Michaux Quercetum after 25 years. *Journal of Arboriculture* 6(6):156-160.
- Schmidt, R. A., and M. A. Klapproth.
1980. Estimation of volume loss and disease hazard due to fusiform rust in slash pine plantations. Intensive Management Practices Assessment Center, Gainesville, Fla., IMPAC Reports 5(2). 16 p.
- Schmidt, R. A., A. E. Squillace, and B. F. Swindle.
1979. Predicting the incidence of fusiform rust in five- to ten-year-old slash and loblolly pine plantations. *Southern Journal of Applied Forestry* 3:138-140.
- Skolmen, Roger G.
1978. Vegetative propagation of *Acacia koa* Gray. *In* Proceedings, Second Conference in Natural Sciences [Hawaii Volcanoes National Park, June 1-3, 1978]. University of Hawaii, Manoa. p. 260-273.
- Skolmen, Roger G., and Marion O. Mape.
1978. Aftercare procedures required for field survival of tissue culture propagated *Acacia koa*. *In* International Plant Propagators' Society Combined Proceedings for 1978, volume 28. p. 156-164.
- Sorensen, F. C.
1979. Provenance variation in *Pseudotsuga menziesii* seedlings from the var. *menziesii*-var. *glauca* transition zone in Oregon. *Silvae Genetica* 28(2-3):96-103.
- Sorensen, Frank C.
1980. Effect of date of cone collection and stratification period on germination and growth of Douglas-fir seeds and seedlings. U.S. Dep. Agric. For. Serv. Research Note PNW-346. 11 p.
- Sorensen, Frank C., and Robert K. Campbell.
1980. Genetic variation in rootability of cuttings from one-year-old western hemlock seedlings. U.S. Dep. Agric. For. Serv. Research Note PNW-352. 8 p.
- Steinhoff, R. J.
1980. Distribution, ecology, silvicultural characteristics, and genetics of the *Abies grandis* — *Abies concolor* complex. *In* Proceedings International Union of Forestry Research Organizations Joint Meeting of Working Parties 1978, Volume One. Province of British Columbia, Vancouver, B.C., Canada. p. 123-132.
- Van Deusen, James L.
1980. Ponderosa pine provenances for the northern Great Plains. U.S. Dep. Agric. For. Serv. Research Paper RM-223. 8 p.
- Van Haverbeke, David F.
1979. Winter injury in a Scotch pine (*Pinus sylvestris* L.) clonal seed orchard. *Silvae Genetica* 28(4):167-169.
- vonRudloff, E., and G. E. Rehfeldt.
1980. Chemosystematic studies in the genus *Pseudotsuga*. IV. Inheritance and geographical variation in the leaf oil terpenes of Douglas-fir from the Pacific Northwest. *Canadian Journal of Botany* 58:546-556.
- Wendel, George W., and William J. Gabriel.
1980. Sugar maple provenance study: West Virginia outplanting — 10-year results. U.S. Dep. Agric. For. Serv. Research Paper NE-460. 5 p.
- Williamson, Richard L., and Robert O. Curtis.
1980. Estimating merchantable volumes of second growth Douglas-fir stands from total cubic volume and associated stand characteristics. U.S. Dep. Agric. For. Serv. Research Note PNW-353. 14 p.

Special Products

- Jenkins, W. Lyman.
1979. Maple jelly. *National Maple Syrup Digest* 19(3):11-13.
- Krochmal, Arnold, and Connie Krochmal.
1979. *Digitalis lanata* Ehrh. a crop in the Netherlands. *Quarterly Journal of Crude Drug Research* 17(2):87-88.

Timber Management

Morsell, Mf., and P. E. Sendak.

1980. Maple syrup containers: effect of storage on the stability of three table grades. Vermont Agricultural Experiment Station Research Report 6. 12 p.

U.S. Department of Agriculture, Forest Service.

1980. Energy and wood from intensively cultured plantations: research and development program. U.S. Dep. Agric. For. Serv. General Technical Report NC-58. 28 p.

Zavitkovski, J.

1978. Biomass farms for energy production: biological considerations. *In* Proceedings of Joint Convention, Society of American Foresters and Canadian Institute of Forestry, St. Louis, Mo., October 1978. p. 132-137.

Zavitkovski, J.

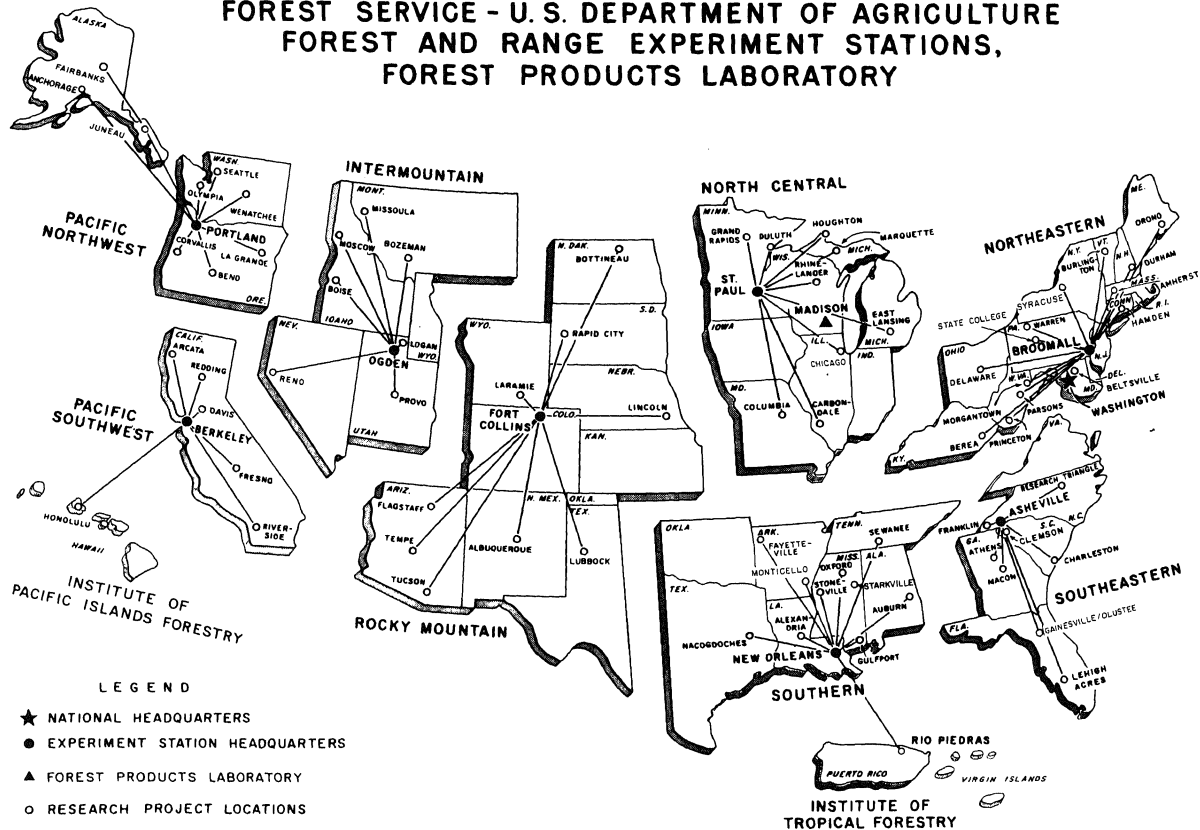
1979. Energy production in irrigated, intensively cultured plantations of *Populus* 'Tristis #1' and jack pine. *Forest Science* 25(3):383-392.

Zavitkovski, J., Edward Hansen, and H. A. McNeel.

1979. Nitrogen-fixing species in short rotation systems for fiber and energy production. *In* Symbiotic Nitrogen Fixation in the Management of Temperate Forests. J. C. Gordon, C. T. Wheeler, and D. A. Perry, eds. Forestry Research Laboratory, Oregon State University, Corvallis. p. 388-402.

FOREST SERVICE - U.S. DEPARTMENT OF AGRICULTURE

FOREST AND RANGE EXPERIMENT STATIONS, FOREST PRODUCTS LABORATORY



RESEARCH HEADQUARTERS

FPL	Forest Products Laboratory North Walnut St. P.O. Box 5130 Madison, WI 53705	SO	Southern Forest Experiment Station T-10210 U.S. Postal Service Building 701 Loyola Ave. New Orleans, LA 70113
INT	Intermountain Forest and Range Experiment Station 507 25th St. Ogden, UT 84401	WO	Forest Service U.S. Department of Agriculture P.O. Box 2417 Washington, D.C. 20013
NC	North Central Forest Experiment Station 1992 Folwell Ave. St. Paul, MN 55108		
NE	Northeastern Forest Experiment Station 370 Reed Rd. Broomall, PA 19008		
PNW	Pacific Northwest Forest and Range Experiment Station 809 NE 6th Ave. Portland, OR 97232		
PSW	Pacific Southwest Forest and Range Experiment Station 1960 Addison Ave. P.O. Box 245 Berkeley, CA 94701		
RM	Rocky Mountain Forest and Range Experiment Station 240 West Prospect St. Fort Collins, CO 80526		
SE	Southeastern Forest Experiment Station Post Office Building, P.O. Box 2570 Asheville, NC 28802		